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

Canadian National Committee Comité National Canadien

# CNC/CIE Annual Report 2012

## 57th Annual Meeting and Workshop

## 2012 November 29-30

Minutes

Division Members' Reports

CNC/CIE Workshop: Opportunities and Challenges in Energy Efficient Lighting - Program

NRC·CNRC

Institute for National Measurement Standards • Institut des étalons nationaux de mesure • Ottawa, Canada, K1A 0R6, Fax (613) 952-1394

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# MINUTES

## CNC/CIE 57th Annual Meeting
## 2012–November–29

NRC·CNRC

Institute for National Measurement Standards • Institut des étalons nationaux de mesure • Ottawa, Canada, K1A 0R6, Fax (613) 952-1394

# MINUTES OF THE 57th ANNUAL CNC/CIE MEETING (DRAFT)

2012-November-29

The 57th annual meeting of the Canadian National Committee of the Commission Internationale de l'Éclairage (CNC/CIE) was held on Thursday, November 29, 2012 at the The Bahen Centre for Information Technology, 40 Saint George Street, Toronto, ON M5S 2E4.

The agenda is given in Appendix A.

**Note**: the following acronyms may be used in this report:

| | |
|---|---|
| CIE | Commission Internationale de l'Éclairage |
| CIE-BA | CIE Board of Administration |
| CIE-CB | CIE Central Bureau |
| CIE-DD | CIE Division Director |
| NC | CIE National Committee |
| TC | CIE Technical Committee |
| CNC | Canadian National Committee |
| CNC/CIE | Canadian National Committee of the CIE |
| CIE/USA | US National Committee of the CIE |
| ISO | International Organization for Standardization |
| IESNA | Illuminating Engineering Society of North America |
| SCC | Standards Council of Canada |
| NRC-MSS | Measurement Science and Standards portfolio of the National Research Council of Canada |
| CONST | Construction portfolio at the National Research Council of Canada |
| NRC-IRO | International Relations Office at the National Research Council of Canada |
| CISET | NRC Advisory Committee on International Science, Engineering and Technology |
| NRCan | Natural Resources Canada |
| DRDC | Defence Research and Development Canada |
| M/AM | Members/Advisory Members |

The Canadian Division Members had submitted, prior to the meeting, written reports for the purpose of our CNC/CIE annual meeting and annual report.

## 1. Call-to-Order and Approval of Agenda:

The 57th annual meeting of the Canadian National Committee of the Commission Internationale de l'Éclairage (CNC/CIE) was called to order at 13:15 on Thursday, November 29, 2012 by V. Venkataramanan, President.

Eighteen Members and Advisory Members were in attendance. The list of all attendees, regrets and proxies is given in Appendix A. Skype teleconferencing was arranged and hosted by L. Whitehead.

The agenda circulated prior to the meeting by email was modified with two additions; it is listed in (Appendix C). Proposed (J. Zwinkels), seconded (J. Veitch), moved.

## 2. Minutes of the 56th CNC/CIE Annual Meeting:

The Secretary indicated that an electronic version of the Minutes of the 56th Annual Meeting had been emailed to all Members and Advisory Members days before the meeting. He reviewed the action items and indicated that all had been done with the exception of AI-7, which has not resulted in the nomination of a new Div. 1 Member, resulting in S. McFadden taking up this role for the time being. This is reconducted as AI-1 for this year. It was moved by J. Zwinkels, seconded by J. Veitch, that the Minutes be accepted as distributed. Passed.

There were no further Matters Arising.

## 3. President's Report:

V. Venkataramanan presented a verbal report; his written report appears in Appendix D.

## 4. Vice-President's Report:

J.A. Veitch presented and discussed her report, which is attached as Appendix E. She explained how requests from SCC to review ISO standards were handled. Nathalie Renaud offered her help for the future reviewing.

## 5. Secretary's Report:

R. Baribeau presented his report, which is attached as Appendix F. He briefly summarized each item in the report. In particular he indicated that the balance of CNC/CIE account at the CIE Central Bureau had been transferred to CNC bank account. The same action will be repeated next year (AI-2).

## 6. Financial and Publications Report:

K.F. Lin presented his report which is in the Appendix. He pointed out the problem of the signing authority for the CNC/CIE bank account, which requires two signatures, currently K.F. Lin and A. Gaertner, at two different branches of the bank, with the original branch in Ottawa. L. Whitehead thinks this could be done electronically rather than in person. It was moved by J. Veitch (seconded by J. Zwinkels) that the President, Secretary and Treasurer would be the designated persons with signing authority. F. Lin will arrange with the bank to have these designated persons and will sort out the details including the possibility for electronic signature (AI-3).

The Secretary indicated that there had been one request for financial support of $3554 in connection with the CNC/CIE Workshop, with $4800 for the 2012 workshop meeting room and related costs, plus an additional $1100 to cover the travel expenses of two invited speakers, minus $2346 of anticipated registration revenue. The request was to cover over costs that may have resulted from low participation to the workshop, and to cover expenses for two invited

speakers. This request had been approved. There were no additional requests raised during the meeting.

## 7. Reports from Division Members

Written reports had been circulated electronically before the meeting and are available at the CNC/CIE web site.

In her presentation, S. McFadden indicated that no one from CNC/CIE attended the Division 1 meeting this year. She asked for guidance on how to appoint a proxy if no Canadian is attending. A subcommittee will discuss this issue (AI-4).

M. Timmings had only a verbal report for the Division 5 as he had been to the Division 5 meeting (held in Virginia in September) which he felt was useless with very small attendance and no Americans showing.

J. Veitch would like to know the progress of TC8-10. R. Baribeau expects to learn more at the WebEx Div. 8 meeting on Dec. 6 2012.

It was moved by J. Veitch, seconded by S. McFadden, to accept all the Division reports. Passed.

## 8. CNC/CIE Subcommittee Reports

### 8.1 CNC/CIE Website report:

J.A. Veitch presented her report, which is attached as Appendix H.

## 9. CISET Annual Performance Review (APR) of the CNC/CIE:

Note: The structure of the NRC relationship with the CNCs can be summarized as follows:

> The NRC maintains affiliations with international bodies, such as the CIE, on behalf of Canada. NRC is authorized by the Federal Government to provide funds for membership with international bodies to enable the Canadian scientific community to have access to international meetings, networking and knowledge exchange. NRC shares the responsibility for these international affiliations with Canadian partners through Canadian Partner Agreements. Each partner creates and maintains a CNC, composed of leading Canadian researchers, to support Canada's affiliation with the relevant international scientific bodies. In the case of the CIE, the NRC maintains a Canadian Partner Agreement with NRC-MSS, which creates and maintains the CNC/CIE to support Canada's affiliation with the CIE. The NRC uses the APR to assess these international affiliations; the CISET reviews these APRs and makes recommendations to the NRC on whether the specific Canadian Partner Agreement should continue.

Réjean Baribeau indicated that that this year's questionnaire was about to be distributed to all NRC Partners/CNCs , and responses will be expected a few weeks after that. He noted that the NRC Grant Transfer Program is currently being reviewed by Treasury Board. Contingent on the receipt and successful review of the 2012 Annual Performance Review questionnaire by CISET, the 2013 dues should be paid without delay.

J. Veitch will prepare this year's response to the questionnaire (AI-5).

## 10. Revision of the Code of Procedure

R. Baribeau indicated that the Code of Procedure needed a revision at least to reflect the reorganization of NRC into portfolios. A committee (A. Gaertner, S. McFadden, R. Baribeau, N. Renaud) will revise the code in English and French. Issues regarding the Advisory members and the nomination of proxies will be part of their discussion. (AI-6).

## 11. Nominations and Appointments (CNC/CIE):

The Secretary distributed a list of the current CNC/CIE Members and Advisory Members (Appendix K).

### 11.1 CNC/CIE Officers:

Only the term of the Publications/Treasurer needed appointment. F.K. Lin has accepted to continue for another term. It was voted in favor of his reappointment. Following the Code of Procedure, the result of this election will be communicated to the General Manager of Measurement Science and Standards for approval (AI-7). F.K. Lin will then be advised of the acceptance (AI-8).

### 11.2 CNC/CIE Members and Advisory Members:

Only the term of F. K. Lin needed reappointment. He has accepted to continue for another term. It was voted in favor. Following the Code of Procedure, the results of this election will be communicated to the General Manager of Measurement Science and Standards for official appointment (AI-6), appointments of these CNC Members for terms from Jan. 1, 2013- Dec. 31, 2016 (AI-4).

J. V. proposed to accept as Advisory Members: Nathalie Renaud, John Richards, Rui Lii. Voted in favor.

M. Timmings observed that some of the members listed were old and possibly dead. N. Renaud asked what the difference was between the different kinds of memberships. R. Baribeau recalled the definitions from the Code of Procedure and observed that we had not been following strictly the Code of Procedure for Advisory members, in particular regarding appointments and terms. Revision of the duties and appointment procedures will be part of the duties for the revision of the Code of Procedure (AI-6).

M. Timmings volunteered to write a letter to the current listed Advisory Member explaining their expected duty and enquiring their willingness to continue to serve (AI-9).

### 11.3 Canadian CIE Division Members:

New Div. 1 Member is needed (AI-1) while S. McFadden continues to act as such.

## 12. Other Business:

### 12.1 Correspondence:

The following demand from Lynne Gibbens, of SCC, was received by the Secretary:

ISO has just approved the establishment of ISO TC 274 Light and Lighting. Canada has agreed to participate on this committee. SCC is just now in the process of establishing our SCC mirror committee for ISO TC 274. The mirror committee will be responsible for providing Canadian input and positions in the international forum. The question that

CNC/CIE has to address is what their relationship will be to the SCC mirror committee and what role they wish to play in contributing to the development of Canadian positions for these light and lighting standards.

Allyson Chrysler also indicated in a letter that having input to this Light and Lighting mirror committee could be important.

J. Veitch said this originates from DIN (Germany), which thinks CIE is too slow adopting standards. L. Whitehead thinks this ISO TC is atypical. It came out of this discussion that this mirror committee should be the CNC/CIE.

A committee (J. Veitch, J. Zwinkels) will respond to SCC (AI-10).

**12.2 Date and Place of next Year's Meeting:**

Next meeting will be jointly with USNC. L. Whitehead mentioned that US was currently considering holding this in the San Francisco Bay area. V. Venkataramanan will liaise with USNC on this matter (AI-11).

**12.3 Other Business:**

The question was raised who should be the delegates to the CIE General Assembly, 14 April 2013, Paris. The President is the default delegate and agrees to go in principle. J. Veitch, J. Zwinkels, M. Timmings, J. Love are also planning to attend and could be alternates.

## 13. Adjournment

V. Venkataramanan expressed his thanks to the participants. The meeting was adjourned at approximately 18:00.

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# CNC/CIE 57th Annual Meeting

2012-November-29

## Action Items

| Action Item Number (AI#) | 57th Minutes Item Number | Responsible | Action |
|---|---|---|---|
| AI-1 | 2 | Arnold Gaertner, Sharon McFadden, Jim Love | Nominate a Div. 1 member |
| AI-2 | 5 | R. Baribeau, K.F. Lin | Transfer money from the CB |
| AI-3 | 6 | K.F. Lin, A. Gaertner | Solve signing authority issues with the bank |
| AI-4 | 8 | A. Gaertner, S. McFadden | Investigate how to appoint proxies when no Canadian present. |
| AI-5 | 9 | J. Veitch | Prepare response to APR questionnaire. |
| AI-6 | 10 | A. Gaertner, S. McFadden, R. Baribeau, N. Renaud | Revise the Code of Procedure |
| AI-7 | 11.1 | R. Baribeau | Communicate K.F Lin nomination to GM of MSS |
| AI-8 | 11.1 | R. Baribeau | Advise K.F. Lin of acceptance by GM |
| AI-9 | 11.2 | M. Timmings | Prepare a letter to the Advisory Member for R. Baribeau to circulate. |
| AI-10 | 12.1 | J. Veitch, J. Zwinkels, | Respond to SCC request about ISO TC274 |
| AI-11 | 12.2 | V. Venkataramanan | Liaise with USNC regarding next joint meeting |
| AI-12 | | | |

## LIST OF APPENDICES

# APPENDIX A

## CNC/CIE 57th Annual Meeting

2012-November-29

### Attendees

| | |
|---|---|
| Réjean Baribeau | NRC-MSS |
| Arnold Gaertner | NRC-MSS |
| Sharon McFadden | Toronto |
| Martyn Timmings | Canlyte Inc./Philips |
| Jennifer Veitch | NRC-CONST |
| Venkat Venkataramanan | University of Toronto |
| Lorne Whitehead | University of British Columbia |
| Joanne Zwinkels | NRC-MSS |
| Sami Qutob | Health Canada |
| André Laperrière | Hydro Québec |
| Andrew Silbiger | Andrew Silbiger Management Inc. |
| K. Frank Lin | Lighting Sciences Canada Ltd. |
| Nathalie Renaud | Institut national d'optique |
| Marco Michele Sisto | Institut national d'optique |
| Rui Li | Lumentra Inc. |
| Krishnan Harikumar | Lumentra Inc. |
| [1]Cristian Suvagau | BC Hydro |
| [1]James Love | University of Calgary |

### Regrets

| | |
|---|---|
| Allyson Chrysler | Consullux Lighting Consultants |
| John S. Richards | PlusAssociates Designers & Consultants |
| Namat Elkouche | Canadian Standard Association |

### Proxies

[1] Attended via teleconference.

# APPENDIX B

## CNC/CIE 57th Annual Meeting

2012-Nov-29

PROPOSED AGENDA:

1. Call to Order and Approval of Agenda — V. Venkataramanan
2. Minutes of the 56th Annual CNC/CIE meeting — V. Venkataramanan
   - Action items
   - Matters arising
3. President's report — V. Venkataramanan
4. Vice-President's report — J.A. Veitch
5. Secretary's report — R. Baribeau
6. Financial and Publications report — K.F. Lin
7. Reports from Division Members
   - Division 1: Vision and Colour — S.M. McFadden
   - Division 2: Physical Measurement of Light and Radiation — J.C. Zwinkels
   - Division 3: Interior Environment and Lighting Design — J.A. Veitch
   - Division 4: Lighting and Signaling for Transport — A. Laperrière
   - Division 5: Exterior and Other Lighting Applications — M.K. Timmings
   - Division 6: Photobiology and Photochemistry — S.Qutob
   - Division 8: Image Technology — R. Baribeau
8. CNC/CIE Subcommittee reports:
   - 9.1 CNC/CIE website report — J.A. Veitch
9. CISET Annual Performance Review of the CNC/CIE — V. Venkataramanan
10. Revision of the Code of Procedures — R. Baribeau
11. Nominations and Appointments (CNC/CIE) — V. Venkataramanan
    - 11.1 Division Members
    - 11.2 Members and Advisory Members
12. Other Business — V. Venkataramanan
    - 12.1 Correspondence
      - Request from SCC regarding ISO TC 274
    - 12.2 Date and Place for next year's meeting (joint with USNC)
    - 12.3 Any other business
13. Adjournment — V. Venkataramanan

# APPENDIX C

## CNC/CIE 57th Annual Meeting

### Action items from CNC/CIE 56th Annual Meeting

| Action Item Number (AI#) | 56th Minutes Item Number | Responsible | Action | Result |
|---|---|---|---|---|
| AI-1 | 2 | R. Baribeau, K.F. Lin | Transfer money from the CB | done |
| AI-2 | 10 | J. Veitch | Prepare response to APR questionnaire. | done |
| AI-3 | 11.1 | R. Baribeau | Appointment of P and VP | done |
| AI-4 | 11.1, 11.2, 11.3 | R. Baribeau | Communicate election results to DG NRC-INMS for formal appointment. | done |
| AI-5 | 11.1, 11.3 | R. Baribeau | Communicate information regarding new President and CIE Division Members to CIE. | done |
| AI-6 | 11.2 | R. Baribeau | Ballot on membership | done |
| AI-7 | 11.3 | Arnold Gaertner, Sharon McFadden, Jim Love | Nominate a Div. 1 member | Reconducted as AI-1 |
| AI-8 | 11.3 | R. Baribeau | Ballot on Div. 4 and 6 Canadian Members | done |
| AI-9 | 12.2 | V. Venkataramanan, J. A. Veitch, M. Timmings, S. McFadden, N. Renaud | Organize workshop and AGM for autumn 2012 in Toronto | done |

# APPENDIX D

CNC/CIE President's Report
November 2012

Venkat Venkataramanan
vvenkat@optics.utoronto.ca

I am pleased to present this brief report on my activities this year as CNC President.

I was formally appointed as the president of CNC/CIE on 19th December 2011 for a term of 4 years. I am looking forward working with the committee.

I have been active in TC-2 63 (Optical Measurements of High Power LEDs).

I am hosting the 57th AGM of CNC/CIE and a one-day workshop on 'Opportunities and Challenges in Energy Efficient Lighting'

I have been continuing my activities as a lighting researcher and educator at the University of Toronto:

- Working with a group of faculty members and lighting industry in Canada, we have applied for a NSERC CREATE funding to initiate a new applied education/internship program. We are awaiting the result.
- We continue to strengthen the Solid State Lighting Network (SSLNet) with increasing participation from the industry and academia. I organized a one-day workshop on Smart Sustainable Lighting in February 2011.
- In partnership with OLED Research Group at Philips, my laboratory is setting up a photometric characterization facility for lighting-class OLED devices.

# APPENDIX E

**CNC/CIE Vice-President's Report**
**November, 2012**

**Jennifer A. Veitch, Ph.D.**
*jennifer.veitch@nrc-cnrc.gc.ca*

In my capacity as Vice-President of the CNC, this year I undertook four tasks.

1. The largest of these was to lead the preparation of the annual report to the NRC International Relations Office. This was submitted on time. I assume that we received an acceptable rating, as the dues were paid. However, I have not seen a copy of the result yet; organizational changes at NRC in April 2012 seem to have interfered with the usual information flow to us.

2. As a result of our renewed connection to the Standards Council of Canada, we have received several requests from Mr. Darryl Kingston (the SCC Program Manager for ISO) for our assistance in the review of documents related to lighting, principally joint CIE-ISO standards up for their mandatory 5-year reviews. Réjean and I have found reviewers for each of these documents and responded by their respective deadlines:

- ISO 11664-4 *Colorimetry Part 4: CIE 1976 L*a*b* Color Space*
- ISO 17166 *Erythema Reference Action Spectrum and Standard Erythema Dose*
- ISO/FDIS 11664-3 Colorimetry -- Part 3: CIE tristimulus values
- ISO/FDIS 17731 Vehicle headlighting systems photometric performance -- Method of assessment
- ISO 8995: Lighting of Indoor Work Places
- ISO 16508: Road Traffic Lights – Photometric Properties of 200 mm Roundel Signals

In addition, we assisted in circulating information about a proposed new activity in ISO, a technical committee on Light and Lighting. Recognizing that our CNC/CIE members include people with a variety of viewpoints with other affiliations, we did not attempt to formulate a group opinion. However, several individuals (including me, representing my role as CIE Division 3 Director) did participate in the consultation.

3. I co-ordinated our responses to a survey from CIE concerning training on lighting topics in Canada; this was sent on Nov. 16.

4. I assisted in the planning of the workshop to take place on Nov. 30.

# Appendix F

## CNC/CIE SECRETARY'S REPORT TO THE 57th ANNUAL MEETING

2012-November-29

The following acronyms may be used in this report:

| | |
|---|---|
| CEN: | Comité Européen de Normalisation |
| CIE-CB: | CIE Central Bureau in Vienna, Austria |
| CIE-BA: | CIE Board of Administration |
| CNC/CIE: | Canadian National Committee of CIE |
| CIE/USA: | US National Committee of the CIE |
| GA: | General Assembly |
| ISO: | International Organization for Standardization |
| NC: | National Committee |
| NRC: | National Research Council of Canada |
| CISET: | NRC advisory Committee on International Science, Engineering and Technology |
| NRC-IRO: | NRC International Relations Office |
| NRC-INMS: | NRC Institute for National Measurement Standards |
| NRC-CONST: | NRC Institute for Research in Construction |
| NRCan: | Natural Resources Canada |

This report covers the period from 2012-January-1 to 2012-November-16.

**CIE MATTERS:**

1. Annual Membership Fee:
   The annual membership fee for the CNC/CIE as a member of the CIE for 2012 was 7,821 €. The NRC-International Relations Office has continued to make these payments on our behalf.

   The NRC, through a Grant Transfer Program, supports Canadian scientific organizations to affiliate with their corresponding international union and program bodies. As part of our CIE membership through the NRC, we are also affiliated with the International Council for Science (ICSU) and 29 other international scientific unions. The NRC membership to these international scientific organizations allows active participation by members of the Canadian scientific community in international scientific endeavors.

2. Revenues from Sales of Publications:

   An agreement was reached with the CIE-CB about the transfer of revenues from sales of publications to the CNC/CIE bank account. The 2012 revenue is 1167.67 € and 909.37 € were transferred on 2012-04-11. The CIE-CB closing balance is currently 512.80. It is intended to repeat this process every year.

3. CIE Draft Standards:
   Draft Standard CIE DS 014-6/E:2012 "Colorimetry – Part 6: CIEDE2000 Colour-Difference Formula" has been reviewed for commenting. No comments issued.
   Draft Standard CIE DS 023/E:2012 "Characterization of the Performance of Illuminance Meters and Luminance Meters" has been sent to NC members for commenting. No comments issued.

4. Mailings:
   CIE announcements and Press Releases have been received and mailed and/or emailed to the membership as appropriate: This material is now available on the CIE website (www.cie.co.at)

**CNC/CIE MATTERS:**

1. New NRC structure

   NRC INMS, which was responsible for CNC/CIE, has ceased to exist as a result of NRC reorganization. Former INMS DG has indicated that this responsibility would now be transferred to the NRC Measurement Science and Standards portfolio, of which Dr. Alan Steele is the General Manager. Our Code of Procedures remains to be modified to reflect this change.

2. CNC/CIE 2012 Annual Meeting:

   The 57th annual CNC/CIE meeting will be on Nov 29, 2012 at University of Toronto, in conjunction with a one-day workshop "Opportunities and Challenges in Energy-Efficient Lighting" organized by the CNC/CIE.

3. Annual Performance Review of the CNC/CIE:

   The NRC International Relations Office has developed an Annual Performance Review (APR) questionnaire, requested by the NRC advisory Committee on International Science, Engineering and Technology (CISET), that focuses on assessing the impact of Canada's international affiliations supported through the NRC Grant Transfer Program. The questionnaire is distributed to all NRC Partners/CNCs. Annual dues and any other payments will be withheld until receipt and successful review of the questionnaire by CISET. We repeated this exercise this year and improved our score which was already excellent and the NRC-IRO has paid the CNC/CIE annual dues for 2012.

4. Requests for Funding:

   There was a request for funding of $3554 related to the CNC/CIE Workshop, with $4800 for the 2012 workshop meeting room and related costs, plus an additional $1100 to cover the travel expenses of two invited speakers, minus $2346 of anticipated registration revenue. This was approved by the board of Officers.

5. Reviewing ISO standards for SCC:

   Reviewing was requested by Standard Council of Canada, and performed by assigned CNC members for the following ISO standards:
   - ISO 8995: Lighting of Indoor Work Places
   - ISO 16508: Road Traffic Lights – Photometric Properties of 200 mm Roundel Signals

   There is a pending request to review ISO 15469:2004 Spatial distribution of daylight -- CIE standard general sky with due date Feb. 2013.

5. CNC/CIE website:

   The website operates at the web address of www.cie-cnc.ca. If anyone has suggestions for corrections, updates, or additions, please contact the Secretary or J.A. Veitch, our website coordinator. A report on the website will be given at the annual meeting.

6. Mailing Lists:

   6.1 At present I maintain 3 mailing lists: Members (15), Advisory Members (37), General Interest (39). In general, the difference between the first two and the third is that the third list tends to receive only CIE material (press releases of CIE publications, *CIE NEWS*) and notices of international conferences. Members and Advisory Members receive, in addition to the CIE material, more CNC information such as various ballots, and the Minutes of the annual meeting and related information.

   6.2 Electronic Mail: I have sent all documents to the CNC/CIE membership this year by email. I try to use the PDF format whenever possible. I now receive all the information from the CIE-CB, such as Press Releases, in electronic format. I also receive announcements of meetings in electronic format, and I forward these electronically rather than sending a large paper mailing. People on the mailing list need to keep me updated on their email address as I don't have the resources to recover that information.

7. Membership:

   A list of our Members and Advisory Members is available and will be discussed during the annual meeting for the purposes of making any changes.

   7.1. Officers:

   President (V. Venkataramanan) and VP (J. Veitch) were appointed in January 2012.

   Publications/Treasurer term expires this year.

7.2. Members:
Three terms (Y. Deslauriers, B. Jordan, I. Pasini) expired and were not renewed.

André Laperrière and Sami S. Qutob have become new Members.

7.3. Advisory Members:
Tim Moggridge has become an Advisory Member.

7.4. General Interest:
As a result of requests during the year, I have added 10 names to our General Interest mailing list.

7.5 Removals:

A few names are to be removed from the General Interest list as the corresponding email addresses have become obsolete. Respectfully submitted,

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# APPENDIX G

Financial and Publications Report

CNC/CIE 2012 financial statement:

| | | |
|---|---|---|
| 1. 2011 balance | 27678.83 | |
| 2. Robertson's claim | -1718.13 | |
| 3. Income CIE CAN/USA | 2882.85 | |
| 4. Catering service | -1758.00 | |
| 5. Hotel service | -1055.19 | |
| 6. Bank monthly charge | -77.35 | @5.95 X 13 |
| 7. Income from CIE CB | 1153.34 | |
| 8. 2012 Nov Bank balance | 27106.35 | |
| 9. Outstanding: Web ser. | -75.00 | (Will show in 2013) |

Regard,
Frank

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# APPENDIX H

**CNC/CIE Web Site Report**
**November 2012**

**Jennifer A. Veitch, Ph.D.**
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## Usage

Usage seems to be rising. For the full year 2011 we had 1481 visits from 878 visitors with an average of 9.08 pages viewed per visit. For the first 10 months of 2012, we had 2194 visits from 1053 unique visitors with an average of 12.22 pages per visit. Note that the unique visitors might be an underestimate, as I know that some organizations, including NRC, present a single IP address to the outside world. Moreover, this will exclude visits made in order to register for the Nov. 30 workshop, as that page was not public in October.

One oddity is that in 2012 the country with the largest number of visits was Ukraine, with Canada and the USA in second and third place respectively. This does suggest that the more real content we can mount, the greater will be our reach.

## Content

I attribute much of the increase to the good work of Sharon McFadden and Harim Kim, whose assistance has been invaluable in improving the site. Sharon has been compiling up-to-date records on TC involvement and generally editing the content. As she prepares material, Harim uses the Joomla platform to update the pages.

One gap yet to be filled is the identification of a member who can undertake the French translations. Sharon is working with various CNC members to solve this need.

***History of Lighting in Canada***

I remain interested in adding content on the history of lighting in Canada, but other pressures have prevented making any progress on this task. This remains a task that could be a great student thesis or research project and I would welcome any volunteers to take it on.

## Maintenance

The cost for the domain registration, site hosting, and maintenance remains low (under $400 even with the transition to Joomla). The service is now provided by Mr. Greg Bridges, son of Bob Bridges.

# APPENDIX I

## CNC/CIE MEMBERS

| CNC/CIE | | | TERM (expiry) | CIE |
|---|---|---|---|---|
| President | V. Venkataramanan | Ontario | 2015-12-31 | |
| Vice President | J.A. Veitch | Ontario | 2015-12-31 | Division 3 |
| Secretary | R. Baribeau | Ontario | 2013-12-31 | Division 8 |
| Publications/Treasurer | [K.F. Lin] | Ontario | 2012-12-31 | |
| | André Laperrière | Québec | 2015-12-31 | Division 4 |
| | Sami S. Qutob | Ontario | 2015-12-31 | Division 6 |
| | J.A. Love | Alberta | 2015-12-31 | |
| | S.M. McFadden | Ontario | 2015-12-31 | Division 1 |
| | L.A. Whitehead | British Columbia | 2015-12-31 | |
| | C. Suvagau | British Columbia | 2015-12-31 | |
| | M.K. Timmings | Ontario | 2015-12-31 | Division 5 |
| | J. Bastianpillai | Ontario | 2015-12-31 | |
| | J.C. Zwinkels | Ontario | 2015-12-31 | Division 2 |
| *ex officio* | A.A. Gaertner | Ontario | | NRC/INMS Member |

[?] = have not returned letters of acceptance.

## CNC/CIE ADVISORY MEMBERS

| | |
|---|---|
| Martin Aitkenhead | Ontario |
| Santo Aguanno | Ontario |
| Eduard Alf | Ontario |
| Chantal Arsenault | Ontario |
| Ian Ashdown | British Columbia |
| M.G. Bassett | Ontario |
| Chrisnel Blot | Québec |
| Mario Bucci | Ontario |
| J. Allyson Chrysler | Ontario |
| Vince Cimino | Ontario |
| W.B. Cowan | Ontario |
| Biman Das | Nova Scotia |
| R.V. Day | Ontario |
| Walter T. Delpero | Ontario |
| Marie Dumont | Québec |
| Marcin Gorzkowski | Ontario |
| John W. Harron | Ontario |
| Kurt Ising | British Columbia |
| S.M. Kaye | Manitoba |
| Donald Kline | Alberta |
| Barbara Kolesnik | Ontario |
| R. Lakowski | British Columbia |
| Denis Lavoie | Québec |
| Ken Loach | Ontario |
| P. Manning | Nova Scotia |
| [J. Bruce McArthur]? | Ontario |
| S.W. McKnight | Ontario |
| Arthur H. Mendel | Québec |
| Tim Moggridge | Ontario |
| Guy Newsham | Ontario |
| Keith Niall | Ontario |
| T. Nilsson | P.E.I. |
| Karen Pero | Ontario |
| J.B. Roberge | Québec |
| A.R. Robertson | Ontario |
| Alexander Rosemann | British Columbia |
| Mankajee Shrestha | British Columbia |
| Andrew D. Silbiger | Ontario |
| Dyoni Smith | Ontario |
| Ralph A. Smith | New Brunswick |
| Nikolay Stoev | Ontario |
| Eli Szamosi | Ontario |
| B.W. Tansley | Ontario |
| Thanos Tzempelikos | Ontario |
| R.W. White | Québec |
| Ernest Wotton | Ontario |

[ ] = require CNC/CIE appointment at annual meeting of 2012-November-29

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# CNC/CIE Division Members' Reports

## CNC/CIE 57th Annual Meeting
## 2012–November–29

NRC·CNRC

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**Division 1: Vision and Colour**
**Report to CNC/CIE Annual Meeting**

Sharon M. McFadden
Email: sharon_mcfadden@rogers.com

The annual meeting of Division 1 was held 26-27 September 2012 in Taipei, Taiwan. The meeting was attended by 5 officers, 12 country representatives (plus an additional 5 by proxy), 14 TC Chairs, and several guests. Canada was not represented. Five Technical Committees (TC) met in conjunction with the meeting: TC1-61 Categorical Colour Identification, TC 1-81 Validity of Formulae for Predicting Small Colour Differences, TC1-83 Visual Aspects of Time-Modulated Lighting Systems, TC1-84 Definition of the Visual Field for Conspicuity, and TC1-86 Models of Colour Emotion and Harmony.

**Highlights**

Four new TCs and one Reportership were proposed at the Division meeting. They are:

TC1-XX (V) Scene Brightness Estimation (Chair: Yoshiki Nakamura JP)

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

TC1-XX (V) Enhancement of Images for Colour Defective Observers (Chair: Po-Cheih Hung JP)

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.

TC1-XX (C) Colour Fidelity Index (Chair: Hirohisa Yaguchi JP)

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.

TC1-XX (C) New Methods for Evaluating the Colour Quality of White-Light Sources (Chair: Yandan Lin CN)

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)

R1-58 (C) Liaison with ISO TC130 *Graphic Technology* (Reporter: Phil Green GB)

Terms of Reference: To investigate and respond to ISO TC130 *Graphic Technology* on matters concerned with colorimetric calculations.

Three TCs (TC1-37: Supplementary Systems of Photometry, TC1-60: Contrast Sensitivity Function (CSF) for Detection and Discrimination, and TC1-87 New Aspects of Colour Rendering) and two Reporterships (R1-54, R1-55) were closed.

**Future Meetings**

The next meeting of CIE D1 will be on Friday and Saturday, 5th and 6th July 2013 at the University of Leeds, Leeds in the UK. This immediately precedes the 12th Congress of the International Colour Association.

## Canadian Participation in Division 1

Based on the latest information available to me, Canada has representatives on 12 Technical Committees in Division 1. They are as follows:

| | | | |
|---|---|---|---|
| TC1-42 | S. McFadden | TC1-69 | I. Ashdown, L. Whitehead |
| TC1-55 | A. Robertson | TC1-70 | A. Rosemann |
| TC1-57 | A. Robertson (Chair), J. Zwinkels, B. Jordan | TC1-71 | B. Jordan, A. Robertson |
| TC1-64 | S. McFadden (Chair) | TC1-77 | B. Jordan, J. Zwinkels |
| TC1-67 | Brian Tansley | TC1-80 | Keith Niall |
| TC1-68 | T. Nilsson | TC1-85 | A. Robertson |

J. Zwinkels is also a liaison between Division 1 and ISO TC6/WG3. If anyone is interested in participating in one of the TCs, especially the newer ones, please contact Sharon McFadden.

**CIE Publications**

200:2012: CIE Supplementary System of Photometry

CIEDS 014-6/E:2012: Joint ISO/CIE Standard: CIE Colorimetry – Part 6: CIEDE2000 Colour-Difference

**Summary of Progress of Technical Committees and Reporterships**

The following summaries of activities in the various Technical Committees of Division 1 are based on the minutes from the 2012 Division 1 meeting. Additional information on some of the TCs can be found in the minutes as well as the Activity Report for 2012. These are available in PDF format on the Division 1 website at http://div1.cie.co.at/. The activity report includes the terms of reference and membership for all TCs and Reporterships.

**Progress in Vision Section (M. Ayama, Associate Director (AD))**

TC1-36: Fundamental Chromaticity Diagram with Physiologically Significant Axes (F Viénot): After the Sun City meeting where the Technical Committee Chair (TCC) presented the matrices that produce colour-matching functions from the cone fundamentals, there were disagreements among the TC members about the values of the matrix coefficients and the resulting tabular values of the colour matching functions. Several TC members have made calculations which will hopefully converge on final values. The work is closely related to the terms of reference of TC1-82 (chaired by Jan-Henrik Wold). The draft of Part II of the Technical Report (TR) will be reviewed among the TC members after the numerical values are checked to provide satisfactory precision in the calculations.

TC1-37: Supplementary Systems of Photometry (K Sagawa): This TC was closed at the Division meeting.

TC1-42: Colour Appearance in Peripheral Vision (M Ayama): The 3rd draft of a TR has been distributed to the TC members and Division officers for a TC vote.

TC1-60: Contrast Sensitivity Function (CSF) for Detection and Discrimination (M. Pointer): The original TCC was taken seriously ill and unable to continue. The Division Secretary took over as interim Chairman at the Sun City meeting in 2011, to try to find a new TCC; this has proved impossible. Thus, the TC was closed at the Division meeting.

TC1-67: The Effects of Dynamic and Stereo Visual Images on Human Health (H. Ujike): A draft of the TR is almost completed, but may need some improvement. The TR will be distributed by the end of 2012. The TCC discussed the issue of using the title and description of specific games, and it was suggested that the TR should described generic rather than specific products.

TC1-78: Evaluation of Visual Performance in the Real Lit Environment (M. Billger): The TCC had sent an email to the AD that the TCC needs to be replaced, due to other commitments. The TCC's laboratory can contribute a review on office lighting research to the TC which is a part of the state-of-the-art section of the research. The Division Director (DD) and AD will write a letter accepting this request and the DD will ask someone else to volunteer to take over the work.

TC1-80: Research Methods for Psychophysical Studies of Brightness Judgments (S. Fotios): An informal TC meeting was held in September 2012, at the CIE conference in Hangzhou. The overall report is currently being revised, and the TCC plans to circulate this for comments in November/December 2012. The goal is a final working draft by March 2013, for a TC meeting at the Paris 2013 mid-term session, giving the final year for the approvals processes.

TC1-82 The Calculation of Colour Matching Functions as a Function of Age and Field Size (J. H. Wold) The TC begins to function as the TR of TC1-36 is near completion. A program to calculate the colour matching functions (CMFs) with inputs of age and field size is almost completed. At the Division Meeting, the TCC demonstrated how it works. There appeared to be a small irregularity in the CMFs for over 70 year old observers. Factors of irregularity and an appropriate upper age limit to which the variable CMFs can be applied will be discussed in the TC. A TC meeting or exchange of information via the internet is planned. The TCC is planning to have a physical TC meeting at the CIE mid-term meeting in Paris in 2013.

TC1-83 Visual Aspects of Time-Modulated Lighting Systems: (D. Sekulovski NL)
This TC was proposed and accepted by the Division at the Sun City meeting in 2011 and can now be established officially as a TC since more than five members were present at a meeting in Taipei.

TC1-84 Definition of the Visual Field for Conspicuity: (Nana Itoh JP) This TC was proposed and accepted by the Division at the Sun City meeting in 2011, and can now be established officially as a TC since more than five members were present at a meeting in Taipei. The Terms of Reference were changed to:

1. To survey, define and classify functional visual fields for practical tasks.
2. To develop guidelines for the layout of visual information to increase the visibility of signs, displays and markings

The TCC briefly introduced the work of R1-37, the precursor of this TC, which describes classifications of the functional visual field, and factors that affect conspicuity in the broadest sense. A TC meeting was held in Taipei. A definition of the functional visual field needs to be understood and agreed upon, and instructions on how to consider the functional visual field need to be clarified.

JTC-1 Implementation of CIE 191: Mesopic Photometry in Outdoor Lighting: (L. Halonen FI)
This TC was proposed as an inter-divisional TC in 2011, and established as the first joint TC in the CIE. The first meeting was held in January 2012 in Vienna, Austria. The second meeting was held in Hangzhou, China in September 2012. Six members introduced their contributions to the TC work. Experiments to contribute to JTC Task 1 were discussed and plans for further experiments were fixed and distributed amongst members.

R1-40: Scene Dynamic Range (Jack Holm): The Reporter will continues his work; there is nothing new report.

R1-49: Above-threshold Pulsed Lights (M. Nicholson & D. Couzin): A draft report was submitted. It is included in the 2012 minutes.

R1-51 Reconciling Maxwell vs Maximum Saturation Colour Matches (Mike Brill): No report to this meeting. The Reporter continues this work, and thus the Division gave the Reporter a one-

year extension.
R1-54 Variability in Colour-Matching Functions: (Abhijit Sarkar IN) This Reportership was established in 2011. A Report has been produced, which is available on the D1 website. It was agreed that a new Reportership should be established to consider the implications of this first report with special reference to potential industrial applications of colour matching functions. The first choice for this new reporter was unavailable, and the DD is seeking an alternative. The Reportership was closed.
R1-57 Border between Luminous and Blackish Colours: (Thorstein Seim SE) This Reportership was established in 2011. No report this time, but the Reporter will present a report at the next Division meeting.

## Progress in Colour Section (E. Carter, Associate Director)

TC1-55: Uniform Colour Space for Industrial Colour Difference Evaluation (M. Melgosa): An extensive report was presented at the Division meeting and is available in the minutes. The conclusion was that the TC could report on the advances made since CIEDE2000 but cannot recommend a specific candidate, i.e., CIE TC 1-55 cannot recommend a new Euclidean colour space that is a significant improvement over CIEDE2000 using existing experimental datasets. Research in this field must be continued by a new TC or TCs with appropriate Terms of Reference.
The TC can also propose further research. Improving CIEDE2000 is possible. For instance, it can mention potential new TCs for the analysis and selection of both appropriate experimental datasets and evaluation metrics, which could be useful for the development of future models. While most current efforts focused on achieving the lowest STRESS values, other metrics may also be valuable in choosing an appropriate uniform colour space among different candidates, bearing in mind the increasing colour space / colour difference / colour appearance interconnections. Metrics include analyses of constant hue (or constant chroma) lines, analyses of local and global uniformity from equal colour-difference contours (ellipsoids), and spaces developed from colour metrics incorporating advances in the physiological knowledge of the human visual system.
TC1-57: Standards in Colorimetry (A Robertson): The final standard in the series is well underway. CIE Draft Standard DS 014-6/E:2012, Colorimetry - Part 6: CIEDE2000 Colour-Difference Formula was sent out for National Committee comments with a closing deadline of 30 September 2012.
TC1-61: Categorical Colour Identification (T. Ishida): The second draft of the TR was rejected by some TC members. The TC held a meeting in Taipei to discuss whether it should close or should continue to try to prepare an acceptable TC report with the current data. It was decided to try to prepare an acceptable report that would include other data for comparison with the data presented in the second draft.
TC1-63: Validity of the range of CIEDE2000 (K. Richter): A first draft of a TR is under development. The TCC intends to send it to the TC members for comments in early 2013. The comments will be included in a second draft to be prepared before the next CIE Division 1 meeting in 2013.

TC 1-64: Terminology for vision, colour and appearance (S. McFadden): This TC has been collecting terms, relevant to Division 1, that were recommended for addition to the ILV. Based on the initial review, terms were divided into three groups:

1. Terms ready for TC ballot (most TC members accepted the current definition),
2. Terms that should not be included the ILV, and
3. Terms requiring further discussion.

The TC members voted on the first two groups of terms and provided additional comments and suggestions about the definitions for terms in the third group. As a next step, the terms and definitions accepted by the TC members are being incorporated into an informal Technical Report. Once members have approved this report, it will be submitted to the D1 Editor.

TC1-68: Effect of Stimulus Size on Colour Appearance (P. Bodrogi): The TC has agreed upon the text of the Technical Report of CIE TC1-68 and the document has been sent to the Division Editor.

TC1-69: Colour Rendering of White Light Sources (W. Davis): Following the meeting at Sun City in 2011, TC members essentially rejected the outcome of that meeting and have failed to reach agreement on what should replace the current CRI if anything. In the end they decided to write a report that will issue no recommendations.

TC1-70: Metameric Samples for Indoor Daylight Evaluation (B. Kranicz): A first draft of the TR was produced in 2010. The draft was circulated during 2011. One of the TC members expressed his idea that the work should be similar to the standard ISO/DIS 3664, 'Viewing conditions – Graphic technology and photography.' This standard involves evaluation of light sources compared to D50. Detailed numerical examples are presented. The plans for 2012 are that the members should decide whether the resulting method should be considered as an extension to ISO 23603:2005(E) – CIE S 012/E:2004, i.e. the same concept and wavelength ranges (in this case only the final administrative steps and the ballot are required) or the concept and style of ISO/DIS 3664 should be followed.

TC1-71: Tristimulus Integration (C. Li): Two new methods based on local power expansion for computing weighting tables were obtained. Li, Oleari, Melgosa, and Xu studied the Oleari method for computing tristimulus values and gave two methods for computing weighting tables. One is for computing zero-order weighting tables which is similar to the ASTM weighting tables of Table 5 and must be used with the reflectance functions corrected using the Stearns and Stearns formula. The other is for computing the second-order weighting tables which is similar to the ASTM weighting tables of Table 6 and must be used with the measured reflectance functions directly.

Two sets of 1nm data were obtained. The first set comprises the Pantone reflectance data at 1nm intervals between 360nm and 780nm. It has 1099 plus 28 samples. The 28 samples have reflectance values greater than 1, which are definitely fluorescent samples. The second set comprises 60 samples between 360nm and 780nm at 1nm interval. These data sets will be evaluated using eight different methods. Testing should be completed by the end of 2012. A first draft of a Technical Report will be prepared in 2013.

TC1-73: Real Colour Gamut (C. Li): The time line for the TC is to evaluate further the new gamut developed by Li, Luo, Pointer, Cho and Kim from October 2012-June 2013. Is this gamut good enough? If not, the plan is to develop a new methodology to improve it and finally a new gamut. Results will be reported to TC members in due course. In the period July 2013-June 2014, a TR will be completed. To achieve this aim, the chair will write a first draft and further modifications will be based on the discussions and suggestions by the TC members. It is hoped that the TC can be closed by the end of June 2014, if not earlier.

TC1-74: Methods for Re-defining CIE D illuminants (J. Schanda): The TR prepared by this TC is currently out for review by Division members.

TC1-75: A Comprehensive Model of Colour Appearance (R. Luo): The 2010 work plan for this TC included completing the data collection of C. Fu's PhD data (Unrelated colours under photopic and mesopic regions) and K. Xiao's PhD data (Same colours under 6 different sizes), and other possible data, completing the implementation of a model, and subsequent testing. The next step is to complete the implementation of the model and test it. The data collection was completed and the TC is working on the forward and reverse models, the report, and a publication on the model. The first version of the TR is to be circulated among the TC members in September 2012. There are some problems that remain to be solved.
TC1-76: Unique Hue Data (S. Wuerger): This TC had three tasks in its work plan. The first is to collate existing sets of unique hue data. The next step is to provide mean hue angles in a uniform colour space and to compute intra- and inter-observer variability in colour difference units (CIEDE2000). Finally, the TC plans to write a TR after generating a database of unique hue data. The report will compare unique hue loci between different viewing conditions and attempt to develop a model of unique hues as a function of the specified parameters. Towards the completion of the second stage, the Liverpool data set has been analyzed. Mean hue angles, as well as intra- and inter-observer variability, has been calculated.

TC1-77: Improvement of the CIE Whiteness and Tint Equations (R. Hirschler): This technical committee has identified the following on-going research:
1. Dan Fleming et al. (Western Michigan University): research focused on the visual-numerical correlation of whiteness formulas and on the development and verification of a new whiteness formula. One paper published, two more submitted for publication.
2. Robert Hirschler et al. (SENAI/CETIQT): research work started on the comparison of CIE and Ganz-Griesser, also on whiteness determination under different light sources. Publication of two papers is foreseen for the IFATCC 2013 and the AIC 2013 congress.
3. Renzo Shamey et al. (NCSU): one paper published on the assessment of whiteness of a series of wool and cotton fluorescent brightened material; another submitted for publication on factors affecting the whiteness of optically brightened material. Ongoing research on the assessments of a range of whites in terms of P/F ratings for about 90 samples.
The technical committee plans to have its next TC meeting in July 2013, linked to the 12th International AIC Congress in the UK.
TC 1-81 Validity of Formulae for Predicting Small Colour Differences: (K. Richter): Some offset prints were available for information and discussion at the CIE Division 1 main meeting, and the TC meeting in in Taipei. The TCC described potential data sources, and methods that could be used to propose an improved formula for the prediction of the colour threshold and small colour differences.
TC1-85 Update CIE Publication 15:2004 Colorimetry: (J. Schanda HU) The work of this TC was been started by enumerating sections that need updating of which there are many. The results of several new CIE Publications need to be incorporated (CIE 165: 2005 CIE 10 degree photopic photometric observer; CIE 167: 2005 Recommended practice for tabulating spectral data for use in colour computations; CIE 170: 2006 Fundamental chromaticity diagram with physiological axes - Part 1; CIE 184: 2009 Indoor daylight illuminants; CIE 185: 2009 Reappraisal of colour matching and Grassmann's Laws; and CIE 192: 2010 Practical daylight sources for colorimetry). The new CIE Standards (Tristimulus Values, CIELAB, CIELUV, and DE2000) need to be reviewed and compared with what is in the present Colorimetry document. Also the work of other TCs has to be considered, for example, TC1-36, TC1-74, and TC2-57.

Based on the progress of the other TCs, actual drafting should start this October-November, with the hope to have the first draft by the time of the Division 1 meeting in 2013.

TC1-86 Models of Colour Emotion and Harmony: (Li-Chen Ou TW) This TC was formed in 2011. In the intervening time the membership of the TC was confirmed and a work plan developed. The following items are in the work plan: in 2012 from January to June – literature survey of colour emotion and harmony; January to September – collecting and sharing existing experimental data of colour emotion and colour harmony; October to December – assignment of new colour emotion/ harmony scales to TC members for developing new models. The first six months in 2013 are set aside for development of models, followed by a period for reviewing and comparisons of new models with refinement of new models during the period October to December. In 2014 comes the final refinement, followed by drafting the TR. It is planned to have a final version completed by March 2015.

The TC held its first meeting here in Taipei. At the meeting the group discussed the scope or limitations of TC1-86; the terminology – in particular the term– "colour emotion" and the collection of data. Concerning data collection, a call was published in *Color Research and Application* (vol. 37:205, 2012) and during the meeting the use of the CIE Collaboration Tool, data format and requirements and deadlines were discussed.

R1-42: Extensions of CIECAM02 (C. Li): This reportership evaluates potential additions to CIECAM02. A summary of recent publications is provided in the minutes.

R1-50: 3D Aspects of Visual Appearance Measurement (D. Simmons): There has been more activity in this area over the last 18 months than previously. The report, together with previous ones, will be sent to selected individuals with the aim of establishing an international panel of experts able and willing to advise on 3D matters. It is too much for one person to cover this field. Efforts to liaise with other CIE divisions have been unsuccessful. In summary, there has been considerable research activity on ocular health aspects (including visual discomfort issues) in 3D displays, 3D display technology, and application of 3D technology to new areas especially in medical, heritage and entertainment industries, but also agriculture and space. The reporter will try to make progress toward forming an international panel of experts before the Mid-term meeting. Also, he will try to decide whether to recommend that a technical committee be formed, or if the area is too peripheral to the CIE and/or should be covered by other groups.

R1-51 Spectral Data Interpolation (Hugh Fairman): The reporter stated that he expects to complete the report by the end of 2012.

R1-53 Gloss Perception and Measurement: (Frédéric Leloup BE) In his progress report, Frédéric Leloup reported that a summary of key research was being prepared, including: 1) historical background on the standardization of gloss measurement, 2) practical limitations of (specular) gloss measurements, 3) the multidimensional nature of gloss perception and 4) state-of-the-art research. The state-of-the-art research report will include such things as the influence of object-intrinsic parameters (Colour, Texture, 3D shape, etc.), the influence of object-extrinsic parameters such as illumination geometry and illumination / viewing distance, perceptual integration of multiple cues to glossiness vs. multidimensional nature, and alternative measurement methods.

R1-55 Enhancement of Images for Colour Defective Observers: (Po-Chieh Hung JP) The approach of the Reporter, was to search papers, books, web pages, references and personal correspondence, as well as US and Japanese Patent Keywords. Based on the information collected, a report was prepared and is available on the Division 1 website. It concluded that there are a variety of ways to enhance images for colour defective observers. These include

parameters to enhance such as colour, lightness, texture or symbol, and usage such as document, computer I/L for customization, pallet making, and mapping. Thus a CIE recommendation in this area may be helpful. Since the report was accepted, the Reportership was closed.

R1-56 Skin Colour Database: (Kaida Xiao CN) A large amount of research work on human skin colour has been conducted involving the measurement of many individuals. The conclusions reached by the Reporter were that a skin-colour database is required for multi-disciplinary research; skin colour variation for individuals is known to be significant; none of the presently available skin colour databases is comprehensive; and existing skin colour databases are not comparable.

Dr. Xaido recommended forming a new TC on this topic. The title would be Skin Colour Database. It could have the following Terms of Reference: To derive a comprehensive skin colour database that is defined by spectral reflectance data, and associated CIE colorimetry, to meet the requirements of different skin researchers and applications. He would be the chair (Kaida Xiao, CN), The roles of the TC members would be to provide consultancy on skin colour applications in the medical community, cosmetic industry and computer graphic; to conduct skin colour measurements for different ethnics groups, to analyze the data and then develop a skin colour database. The proposed work plan would include: 6 months to develop a standard protocol for skin colour measurements, 2 1/2 years to conduct skin colour measurements, 6 months to analyze the skin colour data and develop a skin colour database; and 6 months to write the TR.

It was agreed that the Reporter should write a formal Report and then the above recommendation would be balloted.

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**Division 2: Physical Measurement of Light and Radiation**

Report to CNC-CIE 2011 Annual Meeting
University of Toronto, Ontario, 29 November 2012

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The most recent CIE Division 2 (D2) General and TC meetings were held 22-26 September 2012 in Hangzhou, China in conjunction with the CIE Symposium on "Lighting Quality and Energy Efficiency". D2 now has 42 country members with Kenya being the most recent addition. At the D2 meeting, there were 17 country members, 16 technical committee chairs (TCCs), and 31 guests present. I attended this meeting as country member for Canada and as one of the D2 Associate Division Directors (ADDs).

With respect to previous D2 meetings, there were some notable changes. Firstly, the D2 meeting (Saturday) preceded the technical committee meetings (Monday to Wednesday); the TCCs were asked to send their written reports prior to the meeting; and at the D2 meeting only the progress of a few critical TCs were discussed so that at the meeting priority could be given to strategic discussions.

The minutes of Division meetings are no longer publicly available; they have moved the Minutes of meeting, TC reports, etc. to the CIE Collaboration Tool (ColTool). This ColTool has limited access to TC members only (Note: at the meeting, there was a request from Japan to allow country members access to notifications in ColTool).

Fifteen Technical Committees (TCs) met in Hangzhou: TC2-50 *Measurement of the Optical Properties of LED Assemblies* (Distl); TC2-51 *Calibration, characterization and use of array spectroradiometers* (Young); TC2-59 *Characterization of imaging luminance measurement devices* (Krüger); TC2-62 *Imaging-photometer –based near-field goniophotometry* (Sauter/

Krüger for Steudtner); TC2-63 *Optical measurement of high-power LEDs* (Zong); TC 2-64 High speed testing methods for LEDs (Heidel); TC2-65 *Photometric measurements in the mesopic range* (Goodman); TC 2-66 Termonology of LEDs and LED Assemblies (Schanda); TC 2-68 Optical measurement methods for OLEDs used for lighting (Gerloff); TC2-69 (Blattner); TC2-71 *CIE standards on test methods for LED lamps, luminaires and modules* (Ohno); TC2-73 *Measurement of quantities relating to photobiological safety of lighting products* (Mou); TC 2-74 *Goniospectroradiometry of optical radiation sources* (Pan); TC2-75 *Photometry of curved and flexible OLED and LED sources* (Yu); and TC 2-76 *Characterization of AC-driven LED products for SSL applications* (Chou). There was also an ad-hoc meeting of a few members of TC2-28 *Methods of characterizing spectrophotometers* (Goodman, Bergen)

There was a proposal for one additional Associate Division Director (ADD): Dr. H. Shitomi (country member for Japan) to improve regional representation and to provide a smooth transition when G. Vandermeersch steps down as ADD at the next D2 meeting in Paris; this was approved at the D2 meeting. There is also a new CIE Code of Procedure for ADDs where their rights and duties have been strengthened to assist the DD with the preparation of Division meetings and items for approval as well as taking care of particular strategic tasks (reviewing published reports, leading discussion on definition of terms, etc.); they are no longer responsible for monitoring progress of TCs.

There was a presentation from Martina Paul (CIE CB) about the relationship between CIE and ISO. She reported on the new ISO TC on "Light and Lighting" that was approved on September 18, 2012. The scope of this ISO committee will be complementary to what CIE is doing; DIN will hold the Secretariat and the Chairmanship will come from the CIE. It is planned to have a sub-committee within CIE which will have P-member status on this ISO TC. It was recommended that CIE members also be members on the ISO committees so that there is harmonization in the comments/ballots. With regard to CNC-CIE, we should consider establishing and/or nominating members to sit as experts on a Canadian mirror committee to this new ISO TC.

**Highlights**

A searchable on-line version of the new International Lighting Vocabulary (ILV) is now available and was demonstrated during the meeting. The link is: http://eILV.cie.co.at and provides access to the definitions of more than 1400 terms (in English only at this point in time).

Three (3) new TCs and ten (10) new Reporterships were proposed at the D2 meeting. It was recommended that two of the TC proposals become a Reportership. The resultant twelve Reporterships were approved by the D2 members present but it was decided to postpone discussion on the establishment of the remaining new TC until the next D2 meeting in April 2013 and to focus on advancing the existing TCs.

Editorial and publication activities since the D2 meeting in Sun City:

- CIE 202:2011 – Spectral Responsivity Measurement of Detectors, Radiometers and Photometers

- CIE Draft Standard (DS023-2012) on Characterizing the Performance of Illuminance and Luminance Meters
- The following documents were edited by the D2 Editor: TC 2-17 and TC2-60.

**Review of Existing CIE D2 Publications:**

At the beginning of 2012 a questionnaire was sent to the D2 on the necessity to review existing CIE publications. At the D2 meeting, the outcomes of this questionnaire were presented and discussed. The following publications were confirmed:

CIE 121-SP1-2010 The Photometry and Goniophotometry of Luminaires - Supplement 1: Luminaires for Emergency Lighting
CIE 176-2006 Geometric Tolerances for Colour Measurements
CIE 179-2007 Methods for Characterising Tristimulus Colorimeters for Measuring the Colour of Light

A majority of D2 members have identified the urgent need to update the following technical reports:

CIE 63-1984 The Spectroradiometric Measurement of Light Sources
CIE 70-1987 The Measurement of Absolute Luminous Intensity Distributions
CIE 84-1989 Measurement of Luminous Flux
CIE 121-1996 The Photometry and Goniophotometry of Luminaires

For the other document, no conclusion could be made. Three follow-up reporterships were agreed to prepare revision of the documents and continue this discussion on the necessity to review the documents.

**Proposals for New Technical Committees (3):**

(1) Proposal by George Eppeldauer (US).

**Title:** Recommendations for uniform broadband UV measurements of 365 nm excitation sources.
**TCC:** George Eppeldauer (US)
**TR:** To prepare a CIE technical report on recommendation for uniform broadband UV measurements of 365 nm excitation sources. A procedure is recommended for a given application (non-destructive fluorescent testing of metal parts) to perform uniform broadband UV measurements with low uncertainty. The procedure describes how to select UV-A meters for this purpose. Spectral bandwidth limits will be established to further use many of the existing UV-A meters. Only those meters that do not satisfy the requirements described in the procedure will be rejected. The procedure also describes how to select the 365 nm source for tolerances of the peak wavelength and bandwidths. The procedure describes the calibration and validation of the UV-A meters for the above purposes to obtain a required measurement uncertainty. Guidance will be given for further developments of these UV-A meters such as centre wavelength and minimum spectral bandwidth of spectral responsivity.
**Initial members:** TBN

*Note: the decision on this TC has been deferred to the next D2 meeting in Paris.*

(2) Proposal by Shau-Wei Hsu, Kuei-Neng Wu, Cheng-Hsien Chen and Yuh-Der Jiaan (CN).
**Title:** Glare rating measurement by image luminance measuring device (ILMD)
**TCC: TBN**
**TR:** To prepare a CIE technical report that presents their recent studies at the Taiwan Center for Measurement Standards, ITRI, on the glare rating of experimental indoor lighting space.
**Justification given:** The advantage of this method is that all the needed parameters can be quickly obtained by just using a luminance image if the FOV of the camera is sufficient. They have applied this technique to some experimental rooms with LED lighting installed and found that the measurement results are confirmed with those obtained with conventional instruments. The dependencies of unified glare rating (UGR) on segmentation, position, direction and background luminance were also studied. Comparisons of UGR obtained by this method with those by the illumination simulation software are in good agreement. These methods would be applicable and complement those for feature lighting works.
**Initial members:** TBN
**Discussion:** J. Schanda recommended collaboration with D3 which is also looking at glare rating (TC 3-50)
*Note: this TC proposal was transferred to a Reportership **R2-53***

(3) Proposal by Kuei-Neng Wu (Taiwan)
**Title:** Flicker measurement and flicker index study on solid state lighting
**TCC:** TBD
**TR:** To prepare a Technical Report on flicker measurement and flicker index study on solid state lighting.
**Justification:** Solid state lighting (SSL) products are easily tuned to have various brightness and colour. However, some driving or tuning methods may induce perceivable flicker variation in this SSL. The flicker disturbing human vision may depend on frequency, contrast, luminance level, spectrum, and so on. To control the flicker of SSL in an acceptable range, the study of flicker index and its measurement is desirable. There are some international standards that mention flicker (such as ISO 13406, IEC 61000-415, JEITA ED-2522 and VESA FPDM2) but these standards are either established for evaluating displays or do not consider human perception on lighting. Furthermore, SSL is different from traditional lamps in driven mode and in spectral property, such as modulation method, frequency and CCT. These parameters influence the human flicker perception. As a result, the flicker index should be further studied and verified.
*Note: this TC proposal has been transferred to a reportership **R2-52**.*

**Proposals for new Reporterships (10):**

**(1)** T. Goodman reported on the problem with access to standard lamps since Polaron has stopped producing them. She said that D2 members need to consider how to address this issue. Peter Blattner proposed a new Reportership on standard lamps.
**Reportership R2-58**
**Title:** Standard Lamps
**Reporter**: T. Goodman (UK)

(2) G. Sauter had prepared a presentation on the Definition of Radiance/Luminance and the problems with the current ILV definitions. Time did not permit a discuss of this topic but Peter Blattner proposed a new Reportership on Radiance/Luminance definition.

**Reportership R2-60**

**Title:** Discussion on the Definition of Radiance/Luminance

**Reporter**: G. Sauter (DE)

(3) J. Zwinkels had prepared a presentation on the Definition of BRDF and problems with current ILV definition. She gave a brief oral report at the meeting but time did not permit a full discussion of this issue. Peter Blattner proposed a new Reportership on BRDF definition.

**Reportership R2-59**

**Title:** Discussion on the Definition of BRDF

**Reporter:** J. Zwinkels (CAN)

(4) P. Blattner reported on the problems with the new IEC technical report on Photobiological Hazards (Blue Light) where they had included new units and definitions that are not consistent with CIE recommendation, such as the proposed unit "blue Watts". Peter gave a presentation to IEC on these CIE concerns and D2 recommendations on appropriate terms; the IEC has now adopted the CIE recommended terms. However, it is planned for this IEC technical report to become a Standard and Peter feels that it is important to have a CIE Reportership on this issue.

**Reportership R2-57**

**Title:** Monitoring progress of IEC TR 62477 (application of IEC 62471 to light sources and luminaires for the assessment of blue light hazard)

**Reporter:** H. Shitomi (JP)

**Discussion:** J. Schanda (HU) recommended that the CIE publish a technical note on this CIE work on photobiological hazards units and definitions that the IEC could refer to in their work.

(5) Peter Blattner reported on the status of the review of CIE D2 publications. The list is very long and there are only a few that have been confirmed. These include CIE 176 and CIE 179. It is considered that the highest priority for review are: CIE 121, CIE 63, CIE 70 and CIE 84, where CIE 84 is one of the most cited and used publications and probably needs a complete re-write since many new techniques are available. He proposed establishing a new Reportership on this issue with himself as Reporter.

**Reportership R2-61**

**Title:** Review of CIE D2 Publications

**Reporter:** Peter Blattner (CH)

**Discussion:** T. Bergen (AU) suggested that CIE 70 and CIE 121 could be combined since there is sufficient overlap. T. Goodman (UK) asked if these documents would need a simple updating or a complete re-write. Peter B. thinks that CIE 63 will require a complete re-write and, for this purpose, a new TC would be needed; for a simple update, this could be accomplished with a

Teresa Goodman (UK) proposed two additional reporterships: Recommendations on the need for Revision of CIE 63 and for Revision of CIE D2 documents related to luminous flux and luminous intensity distributions.. Richard Young volunteered to be Reporter for CIE 63 and Tony Bergen volunteered to be Reporter for the second proposal.

(6) **Reportership R2-63**
**Title:** Need for Revision of CIE 63:1984
**Reporter:** Richard Young (UK)

(7) **Reportership R2-62**
**Title:** Need for Revision of CIE D2 documents related to luminous flux and luminous intensity distribution
**Reporter:** Tony Bergen (AU)

(8) J. Pan (CN) proposed a new TC on internal quantum efficiency measurements of SSL products. The following discussion by D2 members present confirmed that this is an important performance parameter but that the application is outside the area of expertise of the CIE. Decision was to form a Reportership to look into this application (approved with one abstention).
**Reportership R2-54**
**Title:** Internal quantum efficiency measurements of SSL products
**Reporter:** Cong Chen (CN)

(9) T. Goodman (UK) proposed a Reportership to look into measurement uncertainty estimations. She said that the CIE 198 document is an excellent reference but industry finds it too complicated to determine the sensitivity coefficients. There is a need for a simple, practical guide.
**Reportership R2-55**
**Title:** Simple, practical guide for measurement uncertainty estimations (supplement to CIE 198)
**Reporter:** TBD (T. Goodman said that it would be someone from the UK)

**(10)** It was proposed by Armin Sperling (DE) that there is a need for CIE D2 to monitor progress in RMOs, e.g. APMP, SIM, EURAMET, etc. with regard to measurement comparisons. It was recommended that this be carried out through a reportership rather than liaison.
**Reportership R2-56**
**Title:** Monitoring progress in Regional Metrology Organizations (RMOs)
**Reporter:** Maria-Luisa Rastello (Italy)

**Dissolution and Changes of TCs and Reporterships**

The following TC has closed since Sun City meeting:
TC 2-58 Measurement of LED Radiance and Luminance (K. Kohmoto)

The following Three Reporterships have closed since Sun City meeting:
R2-32 Visual Appearnace Measurement (M. Pointer)
R2-39 Display measurement standard – liaison with ICDM (T. Mou)
R2-46 Photobiological Safety Measurement of Lighting Products (T. Mou)

Peter Blattner reported that there are 6 TCs that are trying to find a new TCC or must complete their work within 6 months (2-17, 2-32, 2-37, 2-49, 2-53 and 2-56). These TCC have been asked to prepare work plans within the next 3 months. This only applies to TCs that are more than 8 years old and are not yet at CD or ED stage. If this is not ready within 6 months, these TCs will be closed at the next D2 meeting in Paris.

TCCs of TCs that are older than 4 years are asked to prepare a justification for continuing their TC within the next 3 months. TCs that have missed submitting a progress report prior to the D2 meeting have been asked to do so within the next 4 weeks. The following criteria will be applied: the ballot on the CD must be started except for cases that have been referred to independent review panel. The data is to be available on the ColTool. These criteria are more stringent than in the CIE Code of Procedures.

**D2 Strategy/ Technical Discussions**

P. Blattner reported on a request for a letter of support for EMRP project proposal. Erkki Ikonen (FIN) provided background information. He reported that there is a JRP on OLEDs and on Improving Uncertainties in the Field of Radiometry. He also mentioned there will be a call for proposals next year for Energy Efficiency. Erkki is the VP of the EMRP program and is looking for a letter of support from the CIE. He indicated his desire for CIE to be active in the proposed work plan to have greater influence in these areas and recommended that D2 look at these possible collaborations in a more systematic way. Peter Blattner suggested having combined workshops with these EMRP projects or with selected CIE TCs. Erkki said that he did not foresee very active contributions from CIE in EMRP but that it could be a partner, as is now the case for ISO in the Standardization packages.
**Decision:** CIE D2 will provide a letter of support for this EMRP project proposal.

The following items were also discussed by the D2 members present:

- New CIE-CCPR joint technical committee (JTC2) on Principles Governing Photometry, Chaired by Y. Ohno (USA)
- CIE/CCPR workshop on Mise en pratique for candela. J. Zwinkels (Chair, CCPR WG-SP) reported on this workshop that was organized by the CCPR working group on strategic planning where a major outcome was the recommendation to create the new CIE-CCPR joint technical committee (see above).
- SI-base units: candela vs lumen. There have been some discussions within the D2 management regarding the impact of a possible change of the SI base unit from the candela to the lumen. This was proposed for discussion by T. Quinn at the most recent CCPR meetings in February 2012 and is also being considered within the CCPR WG-SP Task Group on the SI. The general view within D2 management is that there is no

compelling practical or scientific (more fundamental) reasons for implementing such a change in SI base unit for photometry.

## Summary of Progress of Technical Committees and Reporterships

Additional information on the terms of reference and membership for all Technical Committees and Reporterships can be found at the website: http://cie.co.at/div2

**TC2-17** Simulated solar radiation (Myers). The TCC has prepared Draft 7.6 which has gone for TC ballot and received one negative vote. This concerns the need for some measurement validation for the new results of one of the tables. The TCC has explained that some of the difference in the old (CIE 85) model and the new model (SMARTS) is due to improved extraterrestrial spectra and some is due to use of more recent ozone absorption data. A measurement validation of these issues is beyond the ability of the TCC to manage and has asked the D2 Executive to provide advice on this matter. T. Goodman (VP Publications) reported that this minority opinion will be reviewed by a CIE Executive independent panel.

**TC2-28** Characterization of spectrophotometers (Goodman, Bergen). The TCCs have made a number of revisions and additions to the report which is now almost complete, except for the section on polarization errors which needs complete restructuring and rewriting. There was an ad-hoc meeting of this TC in Hangzhou with the TCCs and a few members and advisors. A work plan was prepared to complete the revisions and updates of this document with a target date before April 2013.

**TC2-29** Measurement of Detector Linearity (Eppeldauer). The TCC reported that he has continued writing the document according to the submitted outline which includes: Introduction, Definitions, Reasons for Non-linearity - including detectors, detector operating circuits, Measurement conditions and DC detector signal measurement modes. The last section added recently describes signal measurement modes including signal conversion issues for minimizing measurement nonlinearities. Draft 2 of this report has been posted on the CIE web-site.

**TC2-32** Wet horizontal road markings (Johnson). No report.

**TC2-37** Photometry using Detectors as Transfer Standards (Ohno). No report.

**TC2-40** Characterization of luminance/illuminance meters (Blattner). The TCC reported that the draft standard CIE DS 023 was sent to the NC for comments in March 2012 (deadline 2012-08-05) and received 18 comments. These comments were reviewed at the TC meeting in Hangzhou. It is planned to prepare the FDIS for NC ballot in October 2012.

**TC2-47** Characterization and Calibration Methods of UV Radiometers (Sperling). The TCC reported that very few of original TC member list have submitted their required CIE documents (membership application and copyright form) and now there are only 6 official TC members. The TCC is preparing a revised draft 4.5 of the report which includes new inputs and proposed

changes from Tony Bergen to the former draft. There are a few open questions which will have to be solved before TC ballot and it is planned to submit these questions to the Discussion Forum of ColTool before the Hangzhou meeting.

**TC2-49** Flashing lights (Ohno). No report.

**TC2-50** Measurement of the optical properties of LED assemblies (Distl). The TCC reported that substantial changes have been made to the report in light of comments received at the TC meeting in Sun City. The current draft is 3.1 and includes three major contributions from TC members: 1) section on air flow and operational orientation; 2) section on the effect of electrical driving conditions on optical measurement; and 3) correct terms to be used for stabilization, warm-up, etc. The TC met in Hangzhou and discussed critical measurement types and concerns. These included measurement of luminance, angular intensity and special requirements of remote phosphors. The next draft of the report is expected to virtually complete and will be posted to the CIE website in 2013.

**TC2-51** Calibration, characterisation and use of array spectroradiometers (Young). This TC met in Hangzhou. The TCC reported that the change in title and ToR were approved by D2 and that a full draft 5 WD was posted 2012-07-25 and will be discussed in Hangzhou. Many sections still require major contributions to complete the draft. References and equations need to be edited to a common format. The target for preparing a complete draft 6 is March 31, 2013 and a teleconference meeting of TC members is planned before this date to discuss progress and action items. At the TC meeting in Hangzhou, the TCC set up a working group of TC members to develop the section on Calibration Methods and obtained volunteers for the sections on Synchronization and Linearity.

**TC2-53** Multi-geometry colour measurement of effect materials (Roesler). No report.

**TC2-56** Standard on retroreflectance (Miller). No report.
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**TC2-57** Revision of CIE S014-2 (Kránicz). The TCC reported that he has recalculated D50, D65 and D75 as presented in CIE 15.3:2004. Excel files of these results have been sent to the TC members for their review. In these tables, D50 has been calculated with the original $S_0$, $S_1$ and $S_2$ characteristic distributions to a step size of 10 nm and then linearly interpolated to give values for 5 and 1 nm. Thus, the work of this revised Standard is essentially completed and the TC members have been consulted on the number of decimal places to include. This Standard should be ready for ballot before April 2013.

**TC2-59** Characterization of imaging luminance measurement devices (Krüger). TCC reported that he has received no new inputs from TC members and only relevant input from DIN. He has created a new version of the draft responding to the TC comments at the last meeting in Sun City and to the results of the discussions during the DIN meetings. This draft was discussed at the TC meeting in Hangzhou.

**TC2-60** Effect of instrumental bandpass function and measurement interval on spectral quantities (Wooliams). The TCC reported that the TC has completed their report and the

document is currently being balloted by the TC members. There are some TC members that feel that certain topics should be included in more detail in the report. These include: 1) The impact of bandpass correction on integrated quantities; 2) Uncertainties associated with bandpass correction; and 3) Bandpass correction when the bandwidth and/or wavelength intervals changes across the wavelength range of the instrument. The TCC believes that the first issue is part of a bigger picture and should be the task of a new TC entitled "Determining integrated quantities and their associated uncertainties from spectral data".

**TC2-62** Imaging-photometer-based near-field goniophotometry (Steudtner). The TCC reported that Draft 2 of this report was distributed to TC members in December 2011 which is mainly based on progress achieved within DIN. The TCC has received a few recent contributions and these will be included in Draft 2.1 to be distributed to TC members and discussed at the TC meeting in Hangzhou.

**TC2-63** Optical measurement of high power LEDS (Zong). No report but TC had a meeting in Hangzhou.

**TC2-64** High speed testing methods for LEDs (Heidel). The TCC reported that he has had slow response on receiving necessary CIE documents (membership application and copyright forms) from TC members and no inputs to the report since TC meeting in Sun City. The TCC is currently preparing draft 1b of the report.

**TC2-65** Photometric measurements in the mesopic range (Goodman). The TCC reported that a draft of the planned Technical Note has been prepared which highlights requirements for correct usage of terms for mesopic applications, in particular. This has been circulated to a small subset of the TC members for comment and is now being revised prior to distribution for comment to the whole TC. A TC meeting and also a Workshop on this topic were held in Hangzhou at which many of the issues of relevance to this TC were discussed.

**TC 2-66** Terminology of LEDs and LED assemblies (Schanda). Schanda reported that the TC members approved the CD and that the IEC has accepted the new CIE terms. He asked the D2 members present if we should also accept the IEC terms. Schanda has prepared a new draft and some critical terms of the module – lighting, etc. need to be clarified. The TC will review these terms and try to harmonize definitions with the IEC. There may be some terms that have more than one definition which is already the case with the ILV. The TC had a brief meeting in Hangzhou to resolve these issues. At the D2 meeting, it was recommended to publish TC 2-66 report as soon as possible; ideally as a joint CIE-IEC document but if this fails, CIE shall publish its own document.

**TC 2-67** Photometry of lighting and light-signalling devices for road vehicles (Manz). No report.

**TC2-68** Optical measurement methods for OLEDs used for lighting (Gerloff)**.** The TCC reported that "Terminology of OLEDs" proposal has been prepared and a draft was presented at the TC meeting in Hangzhou. There is some concern about overlap between TC 2-68 and IEC SC 34A/working group PRESCO OLED PT which is also working on terminology. The TCC is

trying to adapt the CIE terminology to that of IEC where possible, to avoid problems/ confusion caused by two different definitions. The TCC is also trying to expedite the work within TC 2-68 by splitting up the work in sub-TCs. This proposal has been discussed with D2 management. If accepted, one sub-TC would be "Applications" Chaired by Yamuichi and one sub-TC would be "Fundamental Photometry" Chaired by Gerloff. The IEC SC34A is also working on an OLED standard and some of these topics are colliding with CIE work. CIE CB has started the CIE conflict resolution mechanism with the IEC to resolve this problem.

**TC2-69** CIE classification system of illuminance and luminance meters (Blattner). The TCC reported that the start of this TC was delayed until the publication of the report from TC-40. In the interim, contributions from different countries have been received but no draft has been written. The TC will have its first TC meeting in Hangzhou where the general structure of the document will be discussed.

**TC2-70** Standards for the measurement of reflection and transmittance properties of materials (Rich).-The TCC reported that this TC has had a very slow start. The CIE required documents (membership application and copyright form) from the TC members have only recently been received for the work of the TC to begin. Work will be assigned to the TC members and drafts of the three planned documents should start in the 3rd quarter of 2012. It has been requested that a first draft be ready for ballot by April 2013.

**TC2-71** CIE Standard on test methods for LED lamps, luminaires and modules (Ohno). This TC met in Hangzhou. It is collaborating with CEN (European Standards Organization) TC169 WG7 (chaired by Guy Vandermeersch, Belgium), in developing a draft for EN and CIE standard on test method for solid state lighting products, so that the two standards will be harmonized on technical contents (based on CIE-CEN agreement). This test method is important in that it will be used by European SSL regulations (just as LM-79 is used by ENERGY STAR and other government programs in the U.S.), as the reference for SSL testing accreditation programs. The CIE test method is also expected to be referenced in the IEC performance standards of SSL products and by SSL regulations in various countries. In the current draft, there are two methods for specifying technical requirements; (1) specifying tolerances for standard conditions (e.g., ambient temperature 25±1°C) and critical instrument performance characteristics (e.g., f1' of photometer head < 1.5 % or 2 %) – similar approach taken in IES LM-79; (2) requiring corrections for deviations from standard conditions (based on sensitivity coefficients) and report uncertainty budgets, with no tolerances for the standard conditions and no requirements for instrument performance characteristics specified. The TC also has agreed that uncertainties are required for both methods, and for method (1), the labs meeting all tolerance requirements can report the default uncertainty values provided in this standard in their test report, so that they do not have to evaluate uncertainties of their measurements. The details, however, are still under discussion, and the default uncertainty tables are under development. There is strict time line by the CEN TC, and the draft is expected to be completed by March 2012.

**TC 2-72** The evaluation of uncertainties in measurements of the optical properties of solid state lighting devices, including coloured LEDs (Sauter). No report

**TC 2-73** Measurement of quantities relating to photobiological safety of lighting products (Mou). This TC held its first meeting in Hangzhou. The work of this TC will be close to that of IEC TR62471-4 and IEC TC76. The IEC Standard 62471-1 focuses on the measuring methods including measuring conditions, requirements of the equipment and procedures for industrial applications, whereas TC2-73 is dealing with different measurements with possible methods. There are important issues related to the measurement of these photobiological hazards such as how to measure the testing distance and the size of the apparent source; the conversion of spectral radiance from spectral irradiance is also not strictly valid for LEDs. The blue light hazard is a radiance quantity and cannot be measured from the irradiance on the cornea. Different FOVs are used for different blue hazard risk groups but because of eye movements, the FOV of the optical radiation depends on the exposure. It was also noted that there are significant differences between photometric/radiometric and photobiological quantities where the former are source-based and the latter are eye-based. The latter have uncertainties of 50% or more c.f. 1-5% for photometric quantities. Currently, the TC has only 8 members.

**TC 2-74** Goniospectroradiometry of optical radiation sources (Pan). The TCC reported that there are 8 initial TC members from 7 countries. The first draft 1.0 of the report was distributed to TC members in May 2012 and a new draft and working schedule was prepared and distributed in September 2012. The TC held its first meeting in Hangzhou.

**TC 2-75** Photometry of curved and flexible OLED and LED sources (Yu). The TCC reported that it has 8 members and these were surveyed for issues like luminance, uniformity, luminous flux, colour, viewing angle and ambient contrast ratio. The comments have been collected and uploaded on the TC 2-75 ColTool. The TC held its first meeting in Hangzhou to discuss the terminology and ask for volunteers to prepare the first draft of the report.

**TC 2-76** Characterization of AC-driven LED products for SSL applications (Chou). The TCC reported that the TC has 8 members from 6 countries. The TCC has prepared an outline of the technical report and planned to have the first full draft for discussion at the meeting in Hangzhou.

## Progress of Reporterships

There are 8 Reporterships in D2 but only one Report was received:

**R2-33** Measurement of laser based projection displays (Mou, CN). No report

**R2-39** Display measurement standard – liaison with ICDM (T. Mou). No report.

**R2-42** Measurement for LED luminaires (J. Pan). No report.

**R2-45** Measurement of the illumination uniformity for critical applications (M. Lysko). No report was received.

**R2-46** Photobiological safety measurement of lighting products (T. Mou). No report.

**R2-47** Photometry of curved surface sources (H-L Yu). No report.

**R2-48** The measurement of AC-driven LEDs (P-T Chou). No report.

**R2-49** Standardization of broadband UV measurements (G. Eppeldauer). The Reporter reported that there is a need for a recommendation for broadband UV measurements when using 365 nm excitation sources since these have not been standardized. This would follow-up on the work of CIE TC 2-47 which prepared a TR on UV characterization rather than UV measurements, with low uncertainty. A proposal was prepared for a new TC to work in this area. See new TC proposal (1) above for details.

**Reports of Liaisons**

I submitted written liaison reports for the two liaisons that I serve with other organizations. These liaison reports will be included as Attachments in the official D2 Minutes that are posted at ColTool. These are:

## **ISO/TC6** Paper, pulp and board: optical properties *(*Zwinkels, CAN**)**

**ISO/TC 145/SC2: N519** Safety colours and safety signs – Specification of colorimetric and photometric properties of materials (Zwinkels, CAN)

There were two action points arising from the liaison reports:

- IALA has appointed M. Nicholson as future liaison officer and he has invited CIE to their annual meeting taking place in 2013 in Paris in the same week as the CIE midterm meeting.
- D2 has approved Armin Sperling as liaison officer for OIML, succeeding G. Sauter

## Future D2 Meetings and Symposia

**2013** In conjunction with CIE Midterm Meeting in Paris, France, 12-19 April, 2013. (Note: the CCPR working group meetings will follow the CIE meetings in Paris).
**2014** Kuala Lampur, Malaysia in conjunction with D4 meeting, 3rd or 4th week in April 2014.
**2015** In conjunction with CIE Quadrenniel Meeting in Manchester, UK

**Canadian Participation in Division 2**

*Canada has representation on 8 Technical Committees:*

| | |
|---|---|
| TC2-28 | J.C. Zwinkels |
| TC2-53 | J.C. Zwinkels |
| TC2-57 | J.C. Zwinkels |

| | |
|---|---|
| TC2-59 | T. Moggridge (Westboro Photonics) |
| TC2-60 | J.C. Zwinkels, R.Baribeau (NRC) |
| TC2-63 | V. Venkatarananan (UoT) |
| TC2-65 | J.C. Zwinkels (NRC) |
| TC2-70 | J.C. Zwinkels, N.Rowell (NRC) |

*One Reportership*

| | |
|---|---|
| R2-59 | J.C. Zwinkels |

*Two Liaisons:*

| | |
|---|---|
| ISO TC6: Paper, Pulp, Board: | J.C. Zwinkels (NRC) |
| ISO TC 145/SC 2 Safety colours and safety signs | J.C. Zwinkels (NRC) |

**COMMISSION INTERNATIONALE DE L'ECLAIRAGE**
**DIVISION 3 – INTERIOR LIGHTING AND LIGHTING DESIGN**

***2012 Activity Report to the Canadian National Committee***
2012-November-29

Jennifer A. Veitch, Ph.D. – Canadian Delegate and Division Director (2011-2015)
*jennifer.veitch@nrc-cnrc.gc.ca*

**2012 Division 3 Meeting**
The meeting was held by Webex on on June 8, 2012. I was in attendance, serving as Division Director and as Canadian delegate. Draft minutes of the meeting are available from me or on the CIE web site (http://div3.cie.co.at).

This was the first Webex meeting of a Division. We preceded it with several weeks of preparations using the online CollTool. The TCCs, Reporters, and Liaison Officers sent reports in advance; we also seeded several lines of discussion on important topics. This brought in valuable comments from people who were not official national members. Only voting members of the division were invited to the Webex.

**Current Division 3 Activities**
***Completed reports and publications***
No publications were completed between October 2011 and today. CIE 173 (Tubular Daylight Guidance Systems) was re-issued in 2012 to add an erratum page that corrected a formula error.

***Active TCs and Reporterships***
Including decisions taken at the Webex meeting, there are 14 active technical committees and no open reporterships in Division 3. (NB: I was wrong in 2011, at that time there were two open reporterships, both of which reported in 2012 and were closed.) Terms of Reference and current status of the committees are available on the Division 3 web site. *New activities are in italics.* ~~*Closed TCs are shown in strikethrough.*~~

| TC | Title | Chairman |
|---|---|---|
| ~~3-25~~ | ~~Coordination and development of the IDMP and its data~~ | ~~N. Igawa~~ |
| 3-34 | Protocols for describing lighting | J. Veitch |
| 3-39 | Discomfort glare from daylight in buildings | W. Osterhaus |
| ~~3-42~~ | ~~Lighting design applications~~ | ~~K. Pero~~ |
| 3-44 | Lighting for the elderly | Y. Akashi |
| 3-45 | Luminance-based design approach | Y. Nakamura |
| 3-46 | Research roadmap for healthful interior lighting applications | J. Veitch |
| 3-47 | Climate-based daylight modelling | J. Mardaljevic |
| 3-48 | CIE standard method of UF table calculation for indoor luminaires | P. Thorns |
| 3-49 | Decision scheme for lighting controls for tertiary lighting in buildings | P. Dehoff |
| 3-50 | Lighting quality measures for interior lighting with LED lighting systems | M. Knoop |
| 3-51 | CIE standard general sky guide | S. Darula |
| 3-52 | Energy performance of buildings – Energy requirements for lighting | D. Schornick |
| *3-53* | *Revision of CIE S 008 Joint ISO*CIE Standard: Lighting of Work Places - Part 1: Indoor* | *Y. Koga* |
| *3-54* | *Revision of CIE 16-1970: Daylight* | *A. Pellegrino* |
| *3-55* | *Metrics for sunlighting and daylight passing through sunshading devices* | *M. Fontoynont* |

*Key highlights of TC activities:*
TC 3-25 was closed because the TCC will retire soon. It has not been active in recent years. A new TC on daylight measurement for climate-based daylight modelling might be formed in future.

TC 3-42 was closed because its TCC (Karen Pero) resigned. This committee was to have written a design guide related to CIE Standard S008, but had never made progress towards this goal. At this

meeting, D3 formed a new TC that might revise this standard; therefore we closed this TC and might open a new one following the completion of the work of TC 3-53.

TC 3-34, which I chair, has encountered a challenge. The new Code of Procedure requires unanimous consent of TC members at the Working Draft stage. The WD ballot, which closed in May 2012, resulted in one negative vote. Unfortunately, the comments that accompanied this vote are such that the document cannot be revised satisfactorily (to do so would require changes to the ILV, which is not within the mandate of TC 3-34). I have completed all of the other changes requested by members and have submitted the material to the Central Bureau for the Committee Draft ballot. It won't go out for this ballot until the VP Technical and VP Publications work through a resolution of this impasse. The likely outcome of this problem will be a revision of the Code of Procedure that will provide a means for addressing such problems in future.

Several TCs reported being close to having final reports: TC 3-39, 3-44, 3-45, 3-48, 3-51. TC 3-50 has passed the Committee Draft stage and will proceed shortly to voting by the Division and Board of Administration.

TC 3-46, which I also chair, is required to produce a Working Draft by the mid-term meeting in April 2013, or risk closure. As this topic overlaps with recent and current work we are doing at NRC, I don't see a problem to achieve this stage by the deadline.

TC 3-53 was established to review and possibly revised CIE S008/ISO8995, Lighting for Indoor Work Places. I am a member of this TC. I will be seeking input on this matter from others in the CNC/CIE as the committee proceeds.

*Current Canadian Participation in D3 Technical Committees (October 2012)*

| TC# | Title | Canadian Members |
|---|---|---|
| 3-34 | Protocols for describing lighting | J. Veitch (Chairman); D. Smith (Corresponding Member) |
| 3-46 | Research roadmap for healthful interior lighting applications | J. Veitch (Chairman) |
| 3-47 | Climate-based daylight modelling | I. Ashdown (Member) |
| 3-49 | Decision scheme for lighting controls for tertiary lighting in buildings | C. Suvagau (Member); J. Veitch (Corresponding) |
| 3-50 | Lighting quality measures for interior lighting with LED lighting systems | E. Dikel (Member) |
| 3-52 | Energy performance of buildings – Energy requirements for lighting | A. Rosemann (Member) |
| 3-53 | Revision of CIE S 008 Joint ISO*CIE Standard: Lighting of Work Places - Part 1: Indoor | J. Veitch (Member) |
| 3-54 | Revision of CIE 16-1970: Daylight | A. Rosemann (Member) |

**Other D3 Activities**

At the Webex the Division voted in principle to form a joint technical committee with Division 6 to write a document describing "Visual, health and environmental benefits of windows in buildings during daylight hours". Since that date, D6 passed a similar motion. A TCC has been identified and both divisions are now voting on the specific proposal. The BA will also need to approve such a committee; nonetheless we hope to be able to hold a meeting in Paris in April 2013. The request for this committee came from the Global Lighting Association.

D3 also voted to form an advisory task group co-chaired by the Associate Directors and with members being the editors of the leading journals. The working group is to consult annually on the current state of knowledge in order to provide input to the Division about topics that merit the formation of international consensus committees.

**Next Meetings**
CIE Centennial and Mid-Session meeting, Paris, France, April 2013
Probable Webex, Spring 2014 (to be determined).

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

Canadian National Committee Comité National Canadien

**Division 4: Lighting and Signaling for Transport**
**Report to CNC/CIE Annual Meeting**

**André Laperrière**
**Email: laperriere.andre@lte.ireq.ca**

**CIE DIVISION 4 MEETING –2012**
**Date: 11-09-2012 - 13-09-2012**
**The Inn at Virginia Tech and Skelton Conference Center**

***Technical Committees***

TC 4-15: Road Lighting Calculations
TC 4-21: Interference by Light with Astronomical Observations
TC 4-32: Surface Colours for Traffic Signs
TC 4-33: Discomfort Glare in Road Lighting
TC 4-36: Visibility Design for Roadway Lighting
TC 4-40: Requirements for Retroreflective Traffic Signs
TC 4-45: Performance Assessment Method for Vehicle Headlamps
TC 4-46: 300 mm Roundel Signals
TC 4-47: Application of LEDs in Transport Signalling and Lighting
TC 4-48: White Light on Road Lighting
TC 4-49 Guide to the Properties and Uses of Retroreflectors at Night
TC 4-50 Road Surface Characterization for Lighting Applications
TC 4-51 Optimization of Road Lighting

**1) TC4-15 Road Lighting calculations**

Final draft would be ready before the end of 2012.

**2) TC4-21 – Impact of Roadway Lighting on Astronomical Observation**

This committee had an extensive discussion about the overlap of this committee effort and those of TC 5-28. The concerns of the International Astronomical Union (*IAU*) were also discussed from the stand point of dealing with the impact of roadway lighting on Astronomical Observations. It was decided that the duplication of effort is reduced if TC 4-21 stops their efforts until the completion of those of 5-28. After completion of 5-28, 4-21 will be reformed as a joint Division 4 and 5 committee, in order to investigate the special aspects of roadway lighting, compared to those in the revised document.
Proposal to Division 4: Suspend TC4-21 and combine efforts with Division 5 after the

completion of the work of TC 5-28.

**3) TC4-32 - Surface Colours for Traffic Signs**

Revision of Publication CIE 39-2:1983:
The work on the document was a little delayed and will be refreshed and catched up again. Jürgen Ewald was showing the latest developments on some color research possibilities. With a digital printing system based on a red, blue, yellow black color mixing system it is possible, to prepare any color in a certain gamut on retro reflective sheeting. In this case with physiological experiments it could be possible, that the color areas can be classified by observers and the limitation on the color ranges can be evaluated or confirmed. New input is necessary providing the completing of the overview of existing standards and specifications. Jürgen Ewald will complete his overview chart. The work will be continued by collecting all relevant color standards in the world and to summarize in the CIE diagram. The target is then to minimize all the variations to a guideline of general color boxes.

**4) TC4-33 Fundamentals of Disability Glare**

This was the sixth meeting of the committee with the new chair. The terms of reference for this group are: "*To study the known mathematical description of the discomfort glare in road and vehicle lighting, its scaling and comparisons with field studies and to condense the outcome in a report that should result in methods for discomfort glare assessment*." Slow progress has been made on the draft however the document was reviewed and some discussion was held. There was also a discussion about the current issues with glare in application. Glare from LED luminaires continues to be an issue. Work in the United States, Germany and China is on-going. The document progress will be held until this effort has been completed. The committee also accepted the task of reviewing CIE document 31. The terms of reference will be changed to reflect this activity.

**5) TC4-36 Visibility Metric in Roadway Lighting**

An extensive document review was held during the meeting. The committee completed the review of the current draft. This document will be circulated to the committee for final comments after this it goes to Nigel Parry for editing and then sent for balloting by the end of the year.

**6) TC4-40 Requirements for Retro reflective Traffic Signs**

Draft 18 was the basis of the discussion at this meeting. It was decided to take the recognition characteristic out of the performance assessment technique. The performance calculator tool will be updated with 2003 European headlamp, data and the recognition assessment will be removed. The calculator still needs to be updated with the 2003 European beam data and 'high scene complexity' legibility demand for the passenger car. Also there is need to introduce the demand

luminance curves for truck drivers, corrected with age group. Move headlamp selection right behind the vehicle selection. This allows giving the full scenario coding in the review step, including the choice of headlamp. The document was discussed in detail and Paul Carlson introduced comments and corrections. Introduce necessary corrections as discussed in the meeting and publish draft 19

**7) TC4-45 did not meet in Blacksburg**

**8) TC4-46 300 mm Roundel Signal**

TC 4-46 met in Blacksburg, Virginia, from 1:00 – 3:00 pm on Wednesday, September 12, 2012. Three members and one guest attended. The committee reviewed the terms of reference, and proposed the following change: "Develop a CIE Standard, for proposal to ISO, providing the colorimetric and photometric properties of 200 mm and 300 mm road traffic control roundel signals." Addition of requirements for 200 mm roundel signals is proposed due to the fact that Standard ISO 16508:1999/CIE S 006.1 must be revised and submitted for ballot. This provides an opportunity to consolidate the requirements for both sizes of roundel signals. The intent of TC 4-46 is to complete reviews of any negative ballots, comments, and editorial remarks by January 2013, to allow a Division ballot in early 2013.

**9) TC 4-47 Application of LEDs in Transport Signalling and Lighting**

The meeting began at 1:00 PM and was attended by 14 people of which 11 were members. We began by considering Draft 5b of the Road Lighting Report section by section. Some discussion revolved around the audience to which the Report should be addressed, concluding that it was the operators of the road lighting systems that were the primary audience. There were also discussions about how specific the recommendations in the Report should be, in the light of the rapidly evolving LED technology. Eighteen contributions were volunteered from eight members. These contributions are expected before the end of the year. Draft 6 will then be distributed to members in February and comments requested from members to be considered at a meeting in Paris in April.

**10) TC4-48 did not meet in Blacksburg**

**11) TC4-49 Guide to the Properties and Uses of Retro reflectors at Night**

The committee went through the existing publication 72 and identified necessary changes, in order to bring it up to date. The target group of the document remains practitioners and users of retro reflectors. The theoretical parts will be short. Technical details such as test methods will only be referenced. Assignments for redrafting specific chapters have been given to the active committee members. The optical principles should be consolidated in chapter 4, move current 5.1.1 and 5.1.2 into chapter 4. Add some information on fluorescent retro reflectors without compromising the focus of the document, needs addition to chapter 5 (on materials) and chapter 8 (measurement methods). Introduce principle of retained retro reflectivity and color and sign effectiveness in chapter 7. Only explain basic terms (photometric, daytime and night time color)

for performance measurement and reference the test methods from other publications or standards in chapter 8.

**12) TC4-50 Road Surface Characterization for Lighting Applications**

Giuseppi Rossi: split road marking and road surface in 2 separate documents, because these are 2 total different things. Technical report 44 is marking and 47 is about road reflections aspects. Giuseppe asks permission on the new proposal of the terms of reference. Wet road surfaces will also be included.

**13) TC 4-51 Report – Optimization of Roadway Lighting**

No changes were proposed to the terms of reference:
"*Develop guidance on optimization of road lighting to balance the benefits and costs. Primary issues include accident risk and energy consumption.*"

Four presentations were made on research related to the work program:

a. Ron Gibbons: Strategic initiative on reducing roadway lighting based on traffic;
b. Giuseppe Rossi: Real time roadway lighting control system;
c. Motohiro Sato: Tunnel pro-beam lighting; and
d. André Laperriere: Benefits of LED street lighting and two pilot projects in Quebec.

A literature review on adaptive lighting was completed as part of the strategic initiative project being conducted by Dr. Gibbons. A copy of the literature review will also be posted to the collaboration tool.. The strategic initiative project includes in situ measurement of lighting conditions for a minimum of 2,000 center lane miles on freeways and major arterials in the U.S. These data will be combined with traffic volumes and crash data to evaluate the impact of various lighting parameters on safety, based on roadway type and volume. The data collection and analyses are scheduled to be completed within one year. The results of the analyses will provide the basis to draft recommendations on concepts for adaptive roadway lighting, with work beginning in late 2013. The intent is to complete a technical report by mid 2015.

**14) R4-44 - IALA (International Association of Marine )**

Malcolm Nicholson had a presentation during the meeting. He asked for harmonizing signaling and promised to revise the part of TC4-47 about signalling. The recommendations for Marine can be found on the web site:

http://www.iala-aism.org/iala/publications/publications.php?LeTypePub=1

# Division 5: Exterior Lighting and Other Applications
# Report to CNC/CIE Annual Meeting

Martyn K. Timmings

The 2012 meeting of Division 5 was held 12 September 2012 in Blacksburg, Virginia, USA. The Canadian member of Division 5, Martyn Timmings, represented Canada.

## Changes to Division Executive

At the 2011 meeting, Dionyz Gasparovsky replaced Tom Lemmon as Secretary. At the 2012 meeting, Warren Julian replaced Mary Crawford as the Division Editor.

## Changes to Division Membership

Serbia and Sweden replaced their delegates and a new representative for Malaysia has been nominated.

## Review of CIE Standards and Other Publications

A list of CIE standards and publications that are within the mandate of Division 5 has been prepared and distributed to all Division members.

## Future Meetings

The next meeting of Division 5 will be 17-19 April in Paris, France in conjunction with the interim meeting of the CIE.

The Division accepted the invitation of the Malaysian representative to meet in Malaysia in 2014.

The 2015 meeting will be held in conjunction with the Quadrennial meeting of the CIE in Manachester, UK in July.

## Summary of Progress of Technical Committees

TC 5-18 Practical Design Guidelines For The Lighting Of Exterior Work Areas (Kelvin Austin)

The Technical Committee Chair (TCC) has made progress on several sections of the Technical Report (TR) specifically 4.3 Mast Structures, 5.2 Luminaire Aiming, 7.6 Water Treatment and Sewage Works.

The remaining sections requiring further contributions from Technical Committee (TC) members are:

- 3.5 Signalling, Signage & Navigation
- 3.6 Lighting Controls

- 4.1 Lamps
- 5.1 Design Check List
- 7.3 Petrochemical & other Hazardous Areas.
- 7.7 Railways & Tramways
- 7.10 Service Stations

In particular, contributions are required for 3.5, 3.6, and 7.3 as these are not subjects in which the TCC is knowledgeable. If contributions are forthcoming, then TCC remains confident that Draft 7 (covering all document sections) should be completed for comment in 2012.

Decision 04/2012: D5 acknowledged the progress of TCC and supported the continuation of this TC.

TC 5-20 Guide for Sports Lighting (Tom Lemons)

The TCC submitted a final draft, now called working document, to the CB 2 years ago. In the meantime, the new Code of Procedure and new version of the ILV has been released. The CB asked the TCC for harmonization, but the Chair was no longer able to carry on.

Decision 05/2012: D5 does not want to lose the work that has been completed to date. The DD agreed to search for a volunteer from the relevant TC to complete the document according to the new rules.

TC 5-21 A Guide to Urban Lighting Masterplanning (Mujgan Serefhanoglu)

The working document is out for final TC voting (ends 17-09-12).

TC 5-22 Beam Patterns for Exterior Floodlighting Luminaires (Tom Lemons)

The situation with this TC is similar to that of TC5-20. The TCC submitted a final draft, now called working document, to the CB 2 years ago. In the meantime, the new Code of Procedure and new version of the ILV has been released. The CB asked the TCC for harmonization, but the Chair was no longer able to carry on.

Decision 06/2012: Again the DD agreed to search for a volunteer to complete the document according to the new rules.

TC 5-23 Guidelines for the Use of Different Illuminance Parameters in Outdoor Applications (Patrick Rombauts)

This TC held a meeting in Blacksburg on 11 September 2012. Nine people, including 3 members, attended the meeting and took part in the discussion of the 5th Draft. The plan is to finish the TC Document at the Paris Meeting of CIE Div. 4 and 5 next year. Also, an intermediate “Web Ex” Meeting is foreseen at the end of 2012. The chairman will write the 6th Draft of the TC Report. All Illuminance concepts will be defined in the text together with formulae, practical values; etc. The concept of “Cubic Illumination” will also be defined, although the concept has not being used in practice. An explanation will be given on the reason why and how to apply the concept in practice. The aspect “Lighting Quality” will also be introduced in the document.

TC 5-24 Guide for Architectural and Decorative Lighting (Andre Tammes)

The TCC chair is waiting for contributions from the industry to hire a professional writer to draft

the report. Efforts from DD and CB were not successful so far. The DD kindly asked Division members to help the TCC with finding support. D5 suggested to contact LUCI, as one of the potential stake-holders.

Decision 07/2012: If search for financial support is not be successful in a short time (practically by the end of 2012), the TCC should manage the work of the TC in the usual way (i.e. the TC should draft the document themselves).

TC 5-26 Guide for the Lighting of Sports Events for Colour TV and Film Systems (Alan Smith)

The initial meeting of this committee was held in Vienna in September 2010 at which four members were present i.e. Gilles Page and Jacques Lecocq (France) together with Kelvin Austin and Alan Smith (GB). Peter Jones (Australia) and Tom Lemons (USA) who were not present at the inaugural meeting in Vienna had expressed an interest in contributing to the work of the committee. Furthermore Carlo Rocca (Italy) has shown an interest in the work in hand. In December 2011 the apportionment of responsibilities within the agreed structure and format of the proposed revision of CIE 83 was finalised with individual members of the committee taking on areas of research and development in accordance with their own expertise and experience. There has not yet been a meeting at which all members of the committee have been present – nonetheless communication between members has continued using emails, together with the increasing use of the Colltool facility. As of August 2012, progress has been enhanced by the development of a strong working relationship involving the GB members of the committee and the Society of Television Lighting & Design (STLD) – a UK organisation that has expressed a keen interest in the production of the finished publication. It is proposed to hold a TC meeting in April 2013 at the Interim meeting of the CIE.

TC 5-27 Artificial Lighting and its Impact on the Natural Environment (Peter Strasser)

Peter Strasser left IDA last year and the TC lost contact with him. The TC has not progressed its work. In the mean time Bob Sparks (US), the Executive Director of the International Dark-Sky Association, indicated his availability and interest in replacing Peter as a TCC.

Decision 08/2012: If an additional attempt to contact Peter Strasser is not successful, D5 would regard it as nonavailability of the current TCC, and would appoint Mr Sparks as the new TCC.

TC 5-28 Guide on the Limitation of the Effects of Obtrusive Light (Nigel Pollard)

The TCC will send a short report by 20 Sept to be included in the Minutes.

## Summary of Progress of Reporterships

R 5-16 Photometric Specification and Measurement of Sports Lighting Installations (Tom Lemons)

No report has been received.

R 5-17 Environmental Impact Assessments (M.M. Taylor)

No report has been received.

R 5-18 Comparison of Glare Assessment Methods (S. Voelker)

No report has been received.

$R_L$ 5-19 IAU (International Astronomical Union) (E. Alvarez)

The full report is on Colltool.

Summary: Astronomers have increased communications with the CIE and recognize the need for useful input from astronomy professionals into the work of the CIE. I thank the CIE for their consideration and recommended collaborations.

Full cut-off lighting - As presented during recent CIE conferences, the light just above 90 deg. from zenith is the most damaging to distant observatory (or parks or other valuable dark-sky) sites. This remains a top priority, and we must communicate further if our CIE colleagues have questions about this research.

Spectral output - specific to zones with and without astronomical sites:

1. Astronomical sites - strong emphasis on restricting spectral output to light sources with output similar to low-pressure sodium lamps. Some new, amber, LEDs are trying to mimic this output. Large investments have been made in these astronomical facilities and they are widely recognized for their value. Zones around them should have the tightest restrictions, including in spectral output.
2. All other zones, including sensitivity to photo-biological effects (ref. IAU 2009 Res. B5 for references to this)
3. reduce emission for bluer wavelengths - lower CCT usually helps with this (ref. presentation by Alvarez on behalf of Wainscoat at CIE science symposium in Helsinki, Finland).
4. < 15% emission at < 500 nm is the recommendation being formally reviewed and considered.

Limit lighting levels - use only the amount needed for the task and use zones to create strictest protection around dark sites, slightly relaxed protection in buffer zones around special sites, and reasonable but not wasteful lighting levels in more distant zones that have more activity that may require artificial light at night.

$R_L$ 5-20 IDA (International Dark-sky Association) (M.M. Taylor)

No report has been received.

$R_L$ 5-21 CEN/ISO (A. Stockmar)

The CEN TC 169 Working Group 2 “Lighting of work places” is currently revising the CEN standard EN 12464-2 “Lighting of work places – part 2: Outdoor work places”.

Many parts of the new version will be aligned with the respective parts of part 1 on indoor work places; i.e. it will deviate from the current CIE Standard S015.

The chapter on obtrusive lighting will be kept as originally taken from CIE 150:2003, although it was noted that the model described needs modification in a such way that it will be possible to take into account the distance dependence of the limiting intensities and the façade luminances.

During the last meeting in September 2012 the working group finished its work and will submit the final draft to the CEN TC 169 for consideration before the end of this year. The new standard is expected to be published in the last quarter of the year 2013.

$R_L$ 5-22 IALD (International Association of Lighting Designers) (A. Tammes)

No report has been received.

$R_L$ 5-23 LUCI (Lighting Urban Community International) (C. Chain)

No report has been received.

## Reports: Liaisons

Currently no official liaisons are active. Please note that liaison matters normally handled by CB, and former Liaisons of D5 send their 'message' as report ($R_L$5-XX).

## New items

There were no suggestions for new TC's, Reporterships or liaisons.

# DIVISION 6

## PHOTOBIOLOGY AND PHOTOCHEMISTRY

# Report to the Canadian National Committee
# November 29, 2012

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**Introduction.**

The Division 6 Annual Meeting took place on June 25, 2012 in Montreal, Canada in conjunction with the 36th meeting of the American Society for Photobiology Conference June 23 to 27 at the Delta Centre-Ville.

Terms of Reference of Division 6: To study and evaluate the effects of optical radiation on biological and photochemical systems (exclusive of vision). The list of TCs, their terms of reference and current status is available on the Division web page: http://www.cie.co.at/div6/tcs.htm

**Division Officers.**

| | |
|---|---|
| Director: | Dr John O'Hagan (UK) |
| Associate Director, Photobiological Standards: | Dr. I |
| Associate Director, Photobiological Measurements and Dosimetry: | Dr. Karl Schu |
| Secretary: | Dr. Andrew Smedley (UK) |
| Editor: | Dr. Andy Pearson (UK) |

### 1. Progress Report from Director.

Division Director O'Hagan began his report by reminding those in attendance that the former DD, Ann Webb, was now the President of CIE. The Division has two ADDs: Karl Schulmeister, who was our liaison with ICNIRP, and Koh Kohmoto. The CIE issues a newsletter, which should also be distributed by National Committees. If anyone is not receiving copies, they can register on the CIE web site to receive them direct. The BA had met in Vienna in April 2012. The new CIE Treasurer, Lorne Whitehead, had attended. The ILV had been published during the last year and a beta version of an e-ILV was being trialled. DD O'Hagan had attended a meeting at IEC in Geneva with Martina Paul and Peter Zwick to discuss incorporating the ILV into the IEC's Electropaedia. This would mean that it would be free to look up individual terms. However, it was felt that there was still a market for the paper version.

CIE CB had proposed a CIE Conformity Assessment scheme. This is part of an initiative to have CIE more widely accepted as a standards' body. A proposal has gone to ISO from CEN, prepared by CIE and the German (DIN) standards organisation, for an ISO Light and Lighting committee. This would

compliment TC TC34, which is concerned with lighting technology. The BA had tried using WebEx for a meeting and this had been successful. It was also used for meetings preparing for the CIE meeting in China in September 2012. The advantage was that each person was on an individual computer. The use of the microphone was managed by CB to limit the number of possible concurrent speakers. The Division and its TCs have access to Collaboration Tools. This is an effective way of managing the progression of TC work.

2. **Secretary's Report.** The Division currently has a total of 273 contacts on D6 circulation list. DS should be notified of changes in details, new additions etc. Most of D6 section of CIE web site is maintained by CB, but DS can arrange for updates to those pages which are under the control of the Division, and to pass on edits to CB. There are a few changes to D6 NC reps during the last year: *Korea*: Dong Myung SHIN is replaced by Meeryoung CHO
*Canada*: Yvon DESLAURIERS has recently been replaced by Sami QUTOB
*Serbia*: Zoran LEDINSKI takes over from Ljiljana NOVINIC
*Italy*: Guiseppe MIGALE takes over from Lucia RONCHI ROSITANI
*Japan*: Shu TAKESHITA takes over from Kohtaro KOHMOTO. DD acknowledged the support provided to him by DS.

3. **Editor's Report.** DE reported he had reviewed CIE 151 Weighting of Solar UV and this was with Steve Wengraitis. TC6-15 has been published. Two other reports had been received for review. He also has TC6-08 reportership and TC6-37 which is being reviewed.

4. **Progress Reports from Technical Committee Chairs.**

Reports on TCs were provided by the TCC or a proxy where present. Only currently open TCs are listed below. Please note that the CIE Code of Procedure requires TCs to submit an activity report in advance of the annual meeting to include a review of TC members, a review of work carried out during the last year and a work plan with dates and milestones to complete the technical report. If no activity report is received then the TC will be considered for closure. Action items are highlighted in yellow. TCs identified for closure are highlighted in red. Where the Division feels that TCs highlighted as "to be closed" should still remain the subject of a technical report, there is, of course, the option of reopening the subject.

**6-08 Guidelines for Obtaining Action Spectra (TCC: Sliney).**

The final draft of this TC has been submitted to DE. The last TC vote only resulted in one response. Peter Zwick will investigate what the CIE Procedure says about this type of situation.
*–Action: DE to edit; PZ to investigate*

**6-15 Computerized Approach to Reflection, Transmisson and Absorption Characteristics of the Human Eye (TCC: Lund).**

This report has now been published as CIE 203-2012.

**6-20 Phototoxicity in Domestic and Industrial Environments (TCC: Gibbs).**

This was closed in 2011.
*–To Be Closed*

**6-21 Low Level UV-A Cataract (TCC: Sliney).**

Has been seen by DE. Still awaiting the completion of references. *–Action: Sliney to complete refs and return to DE*

**6-28 Standardization of Sunscreen Testing (TCC: Césarini / Osterwalder).**

TCC Uli Osterwalder was waiting on input from 6-24 before working this TC, although no update was received. The FDA in the US had recommended testing in vitro only. There are possible conflicts with approaches in the rest of the world. Need to consider whether it may be more appropriate to convert the work into a reportership.
*–Action: Extended to 2013 / DS to chase for update*

**6-33 Photoimmunological Effects Mediated Through the Skin (TCC: de Fabo).**
Closed in 2011.
*–To Be Closed*

**6-36 UV Protective Materials Used in Shading (TCC: Nel-Sakharova).**
A report was presented in 2011 to say that the work was nearly complete. Needs to be chased: it may be worth considering transferring to a reportership if there are issues with TC vote. Alternatively, close and re-open if considered important.
*–Action: TCC to provide TC rep/DS to chase*

**6-37 Light and Retinal Disease (TCC: Sliney).**
Draft submitted to DE. May need to consider a minority opinion of one of the TC members.
*–Action: DE*

**6-39 UV Radiation in Lighted Environments (TCC: Kohmoto).**
Recommended for closure in 2011. However, a mature report exists, but needs to be put in the new format. Could also consider amending to a reportership.
*–TCC Kohmoto*

**6-42 Lighting Aspects for Plant Growth in Controlled Environments (ATCC: Navvab).**
A final report has promised by the end of 2012 for publication in 2013.

**6-43 UV Water Disinfection (TCC: Cabaj).**
Agreed to close in 2011.
*–To be Closed*

**6-44 Illuminators for Treatment of Infant Hyperbilirubinemia (Vacant).**
The draft report was reviewed by Mike Lynn and Graham Hart, who work in this area in the UK. Graham Hart has agreed to complete the work either as the new TCC or as a reportership. Since none of the TC members are now active, the latter option seems sensible. Mike Lynn can assist. It was important that the work done by members of the TC was acknowledged in the report.
*–Action: DD/DS to clarify process and then contact Hart*

**6-45 Optical Radiation Hazard Measurements in the Workplace (TCC: Angelo).**
A progress report has been received. Many of the TC members are no longer working in this area. A draft has been circulated to TC members and comments are awaited.
*–Action: TC to complete by end of 2012*

**6-46 Standardized Action Spectrum for UV Disinfection (Vacant).**
Closed in 2011.
*–To be Closed*

**6-48 Typical Minimal Erythema Doses (TCC: Beer and Miller.**
Has been seen by DE. Awaiting final report, which is promised shortly. DS to chase if not received.
*–Action:DS*

**6-49 Infrared Cataract (TCC: Okuno).** Report received. Sliney is having a meeting with TCC within a week. Suggest option to have WebEx meetings to include Europeans. Report expected in 2013/14.

**6-50 Photodegradation of Pharmaceuticals (TCC: Tønnesen).**
Progress report received. TC report cannot simply be a merger of two published scientific papers. DD had sought advice from CB about this. Final report in 2013, which may be a summary of the two papers, perhaps as a technical note.
*–Action: DS to clarify technical note format with CB*

**6-51 Standardized Solar Simulator Spectral Irradiance for Sunscreen Testing (TCC: Sayre).**
Closed in 2011.
*–To be Closed*

**6-52 Proper Measurement of Passive UV Air Disinfection Sources (TCC: Vincent).**
TCC Vincent requested extension to 2013 at 2011 meeting. Activity report received in 2012.
*–Action: Extended to 2013*

**6-53 Personal Dosimetry for UV Radiation (Vacant).**
Closed in 2011
*–To Be Closed*

**6-55 Photobiological Safety for LEDs (TCC: Horak).**
TCC Horak will supply draft of the report to DD to decide on how to publish. Then the report will go to DE.
*–Action: TCC Horak, DD and DE*

**6-57 Standardization of Terms and Action Spectra for Blue Light and Retinal Thermal (TCC: Kohmoto).**
Was proposed for closure in 2011. However, the comparison of methods for interpolation of the blue light hazard function could be carried out relatively quickly to provide the spectrum in 1 nm steps. Kohmoto, O'Hagan, Sliney, Mou and Horak all agreed to provide their interpolations to DD and the practical implications for the analysis of different source spectra. Similar for the retinal thermal hazard function. Some of the text can be taken from an earlier report.
*–Action: TCC Kohmoto, DD, Sliney, Mou and Horak*
*by end of July 2012*

**6-58 A Recommendation on Lower Limits for UV Exposure (TCC: Passchier).**
Published as CIE 201- 2011.

**6-61 Measurement of Radiation Using the Phytometric System for Plant Applications (TCC: da Costa).** Progress report received. Intending to present final report in Paris in 2013.

**6-62 Action Spectra and Dosimetric Quantities for Circadian and Related Neurobiological Effects (TCC: Cooper).**

No progress report received.

**6-63 Photobiological Strategies for Adjusting Circadian Phase to Minimize the Impact of Shift Work and Jet Lag (TCC: Lockley).**
No progress report received.

**6-xx/1-67 The Effects of Dynamic and Stereo Visual Images on Human Health (D6 rep: Sliney)**
Joint TC with D1, but Sliney not getting anything from D1. TCC is from Japan. Need to find out from D1 what is happening. The health issues raised in previous years no longer seem to be reported. D1 noted in late 2011 that if no progress would be closed in 2012.
*–Action:DS*

**6-64 Optical Safety of Infrared Eye Trackers Applied for Extended-Durations (TCC: Sliney).**
TC had voted in 2011. TCC to update the draft and submit to DE.
*–Action:TCC Sliney*

**6-65 Photobiological Dosimetry for Low Level Laser/Light Phototherapy (TCC: Lyon).**
TCC has not received material from TC members. Suggest DS should ensure TCC has the correct list of TC members.
*–Action:DS*

**6-66 Rationalising UV Units (TCC: McKenzie).**
Proposed by then-DD Webb at 2011 meeting. Progressing rapidly: report is in CIE format and has just completed TC vote. Will be passed to DE for CIE editing shortly and then ballot (and as joint report with WMO will also be passed to UV-SAG).
*–Action: to be sent to DE*

**5. Progress Reports from Reporters R 6-37 Definition of UV wavebands.**
Sasaki hopes to finalise in 2012. Draft is currently with DE.

**R 6-40 A survey of action spectra in the scientific literature: 19XX – 200X.** Part 1 of a long report was provided to DE in 2009, and the rest was approaching completion in 2010. DS to chase where this has got to in editing and a progress report from Rep: Alois Schmalweisser. Then consider best publishing route (due to length).
*–Action:DS*

**R 6-41 The issues of vitamin D kinetics.** No update received. DS to chase for status; if no response close.
*–Action:DS*

**6. Progress Reports from Liaisons with ICNIRP, CEN, WHO, IEC and ISO**
Our ICNIRP liaison Karl Schulmeister reports that the two new ICNIRP exposure limit guidelines, one for laser radiation and one for broadband optical radiation in visible and IR should be approved by the Main Commission by the time of the CIE meeting and will have been submitted to Health Physics. Publication is estimated to take place by early 2013. It is also noted that ICNIRP plans to maintain the issue of the symbol D used for radiance dose, that is reserved in the CIE vocabulary for detectivity. Although it was acknowledged by ICNIRP's main commission that it was important to maintain the CIE vocabulary, in this case there were certain disadvantages in doing so that could be avoided by

using D for radiance dose. DD attended the ICNIRP workshop in Edinburgh. Emilie van Deventer of WHO had reported on the United Nations initiative to encourage energy efficient lighting in developing countries. However, no account was being taken of optimum lighting conditions for health or intended purpose. DD had suggested that there should be cooperation between CIE and WHO. CB were progressing this.

**7. Dissolution of TCs and reporterships**

This agenda item was mainly dealt with as part of item 7 (above). However, we have been reminded that TCs and reporterships can only be dissolved by the BA. Therefore, DD and DS will prepare a resolution to ensure that the TCs closed in 2011 at the D6 meeting have been formally closed.
*–Action: DD & DS*

**8. Proposals for new TCs and Reporterships**

Revision of CIE S009. The original TC 6-47 no longer exists. DD had met with IEC Central Office to discuss the revision of S009 and its IEC equivalent, IEC 62471. It was agreed that this should be carried out by a joint committee with members of D6 and IEC TC76 WG9. In practice, it was likely that the same people would represent both organisations. However, it was proposed that the opportunity should be taken to develop a full product standard. Therefore, CIE would be responsible for the "science", which included the specification of the risk groups. IEC would be responsible for issues such as engineering controls and administrative controls (such as labelling). Sliney, along with collaborators, has produced a paper outlining the original rationale for the risk groups. He agreed to send a draft to DD.
*–Action: Sliney*

There may be an advantage in inviting TC34 members to the TC76 WG9 meeting in the UK in October 2012. IEC TC34 have set up a photobiological safety group and have drafted a "simplified" blue-light hazard assessment technical report. It was suggested that DD should be the Chair of the proposed joint committee and set it up. The exact mechanism will need to be investigated.
*–Action:DD*

Proposal for joint TC with D3 on daylight 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 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. that TCs and reporterships can only be dissolved by the BA. Therefore, DD and DS will prepare a resolution to ensure that the TCs closed in 2011 at the D6 meeting have been formally closed.
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**Rationale**: Surprisingly there is no document that has the status of a consensus-based international document that pulls together these various aspects of windows. The absence of such a document is causing some friction between lighting professionals and building scientists focused on building energy efficiency. In some parts of the world there is pressure to reduce window sizes (or to permit buildings not to have windows) in order to maximize the insulation value of walls. The Global Lighting Association, in its correspondence with CIE, has specifically asked CIE to provide it with such a guidance document. Moreover, researchers are beginning to propose their own preliminary criteria for daily light exposure. By the time such a committee gets to that point in its work, it will be time for an international review to assess these proposals and to set directions for new work. Even if no definitive statement is possible at that time, the JTC could produce a document similar to the recently published document proposing that there does exist a minimum necessary UV exposure (CIE 201:2011: Recommendations on Minimum Levels of Solar UV Exposure). It was agreed that D6 should support the work. Sliney offered to be involved. Danish D6 NC representative Christoffersen may also be interested. D6 NCs should also be approached to offer representatives.

A proposal had been received from Ad Brand for a new TC on the use of artificial UV exposure devices for benefits to health. This will need a TCC before progressing. There was also concern that the science was not mature enough to provide specific advice. CEN TC169 WG13 on the non-visual benefits of light is organising a closed workshop, which will bring together experts from around the world to agree an action spectrum. It is proposed that CIE will supply the reporter, who will prepare a CIE report as a reportership.

**10. Division Officers**

The review of Division Officers will start in at the next meeting in 2013.

**11. Future Meetings**.

The next D6 meeting will be held in conjunction with the mid-sessional and Centennial meeting would be held in Paris (12 to 19 Apr 2013). Tongsheng Mou invited D6 to hold its 2014 meeting in Hangzhou, China. The 2015 D6 meeting will be held in conjunction with the quadrennial meeting in Manchester, UK.

**12. AOB**

Koh Kohmoto suggested that the D6 terms of reference should be reconfirmed. It was agreed that this should be considered over the year.

### 13. Adjournment and Closing Remarks

DD thanked everyone for attending and the patience of those on WebEx. Although the use of WebEx was not successful for this meeting, it was likely to be useful for TC meetings. The use of WebEx can be arranged through CB. It was important for TCs to use Collaboration Tools.

The meeting was adjourned at 1230.

**The CIE Division 8 "Image Technology" and its Activities in 2011/2012**

## Report to the CNC-CIE, 29 November, 2012

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Institute for National Measurement Standards
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## *1- Highlights*

CIE Div.8 informal meeting was held in conjunction with CIC in San Jose on Nov 9, 2011. After reviewing the current activities of each TC and Reportership, participants brainstormed for future activities. As a result, 5 TC ideas were given:

- "3D archival digitizing recording and format": Extend the work of TC8-09 to the capture and storage of 3D color content.
- "Efficient material perception and communication file format": BRDF, surface properties; communicate color for non-isotropic media.
- "Visual differences between images": Extension of TC8-02 to images rather than pixel-by-pixel color (e.g., Daly, Ferwerda models etc.).
- "Evaluation of 3D content with the QUALINET project"
- "device color gamut description": description, format and procedures.

Ideas were also given for 3 Reporterships:

- "Review of image difference metrics" : Survey of image difference metrics
- "HDR encoding/processing" : Survey of HDR encoding and processing methods. Possible basis for new, more focused HDR TC.
- "Common color appearance color reproduction" : Color reproduction that aims at consistent/common appearance across media and viewing conditions rather than matching appearance which is often impossible.

The director and secretary are to embody the ideas into the real activities.

Some details about TC activities are given in Paragraph 3 below.

An informal meeting will be taking place December 6th 2012. To reduce your travel loads, this meeting will be held through Internet with the WebEx remote conference system offered by the CIE.

## *2- Organization*

Terms of Reference:

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.

Domaine d'activité:

Etudier les méthodes et préparer des recommandations et des normes, relative aux aspects optiques, visuels et métrologiques de la communication, du traitement et de la reproduction des images, applicables à tous les types de dispositifs d'acquisition, de conservation et de restitution, aussi bien analogiques que numériques.

Web sitehttp://div8.cie.co.at/

### 2.1 Division Officers

Director of Division Jan Morovic
Secretary of Division Po-Chieh Hung
Editor of Division Ann McCarthy

### 2.2 Official Division Members

Canadian Member: Réjean Baribeau

### 2.3 Liaisons

CIE Division 8 has liaisons with the following organizations and liaison officers:

ISC/TC42: Photography (Mike Pointer)
ISO/TC130: Graphic Technology(Danny Rich)
ISO/IEC/JTAG2:Joint Technical Advisory Group (JTAG) 2 for Imagery(J. Schanda)
ICC -- International Colour Consortium (Cacant)
IEC/TC100 Multimedia Equipment and (Danny Rich)
ASTM/E12 Color and Appearance (Mike Pointer)

### 2.4 Publications and Technical Reports from Division 8

CIE 156-2004, Guidelines for the Evaluation of Gamut Mapping Algorithms (TC8-03)
CIE 159:2004, A Colour Appearance Model for Colour Management Systems: CIECAM02. (TC8-01)
CIE 162:2004, Chromatic Adaptation Under Mixed Illumination Condition When Comparing Softcopy and Hardcopy Images (TC8-04)

CIE 163-2004, The Effects of Fluorescence in the Characterization of Imaging Media (R8-05)
CIE 168:2005, Criteria for the evaluation of extended-gamut colour encodings (TC8-05)
The work of TC8-06, Vocabulary, has become part of the revision of CIE Publication 17, International Lighting Vocabulary.
CIE 162:2010: (incl. Erratum 1): Chromatic Adaptation under Mixed Illumination Condition when Comparing Softcopy and Hardcopy Images.
199:2011: Methods for Evaluating Colour Differences in Images.

### 2.5 Technical Committees

TC8-02: Colour Difference Evaluation in Images – closed
TC8-07: Multispectral Imaging
TC8-08: Spatial Appearance Models – to be closed
TC8-09: Archival Color Imaging
TC8-10: Office Illumination for Imaging
TC8-11: CIECAM02 Mathematics
TC8-12: Video Compression Assessment

### 2.6 Reporterships

R 8-09 Output Linearization Methods for Display and Printers(Klaus Richter).

## *3- Technical Committees work in progress*

### TC8-02: Colour Difference Evaluation in Images

Terms of Reference:
To study, develop and standardize methods to derive colour differences for images.

Chair: Ronnier Luo
Web site: http://www.colour.org/tc8-02/

The technical report has been published at the end of 2011. The Summary/Résumé are:

SUMMARY
This Technical Report is concerned with the evaluation of colour differences between two similar images where the output media and the output viewing conditions are similar for both images. It is based on previously published work by CIE and other experts in this field. The report begins by reviewing the factors affecting the evaluation of these colour differences. Various methodologies are described to evaluate colour differences using both visual and instrumental methods. A series of reference colour digital images are presented. A method for statistically analysing average colour differences is described. All the activities of the Technical Committee in charge of this report are finally summarized and recommendations are made to apply either CIELAB or CIEDE2000 for evaluating colour differences for a pair of images displayed in the same medium side by side under the same illumination conditions.

This committee is now closed.

## TC8-07: Multispectral Imaging

Proposed Terms of Reference:
To study, develop, and recommend encoding techniques and data formats for the exchange of multispectral images, and to provide test procedures for the evaluation of multispectral imaging systems.

Chair: Dr. Masahiro Yamaguchi

This TC was formed in 2002 and was to cover the following subjects:
1. Spectral test sets
    1.1 data sets for simulation and testing,
    1.2 definition and fabrication of an experimental spectral test chart,
    1.3 test chart of pairs of metameric colors.
2. Definition of sets of color matching functions of typical human observers to be used in multispectral imaging systems for the definition of observer metamerism.
3. Encoding of multispectral image data
    3.1 linear encoding and quantization,
    3.2 nonlinear encoding and quantization,
    3.3 mixed spectral and spatial encoding.
4. Definition of data formats for the exchange of multispectral image data.
5. Recommendations for the definition of quality of a multispectral system and test procedures.

This TC has a new chair: Masahiro Yamaguchi. Last meeting was 2010 June 16th where a draft of technical report was introduced by Markku Hauta Kasari, and a Working group for spectral test sets was organized.

## TC8-09: Image Archiving

Proposed Terms of Reference:
To recommend a set of techniques for the accurate capture, encoding and long-term preservation of colour descriptions of digital images that are either born digital or the result of digitizing 2D static physical objects, including documents, maps, photographic materials and paintings.

Chair: Robert Buckley

No new information available at this time. The following is a repeat of last year:

The TC is collaborating with the US Federal Agencies Digitization Guidelines Initiative, which is a collaborative effort to establish guidelines for the digitization of static visual materials by agencies of the US government. Several members of this initiative are TC members.
In early review of the results from the survey conducted in 2009, the committee recognized that one encoding will not meet the needs of all use cases and content types. Rather than focus on one particular use case and content type combination, the committee will review a range of encoding

methods, including spectral and tristimulus based methods, and discuss the applicability, practicality and risk of each in digitizing originals for use cases from the cultural heritage community.
Working with the Still Image Group of the Federal Initiative, the committee initially is concentrating on practical solutions that concentrate on existing RGB and other tristimulus-based methods to encode the data from imaging content in a manner that has a known accuracy, can create an accurate representation of the object when displayed, and where the encoding model is sustainable. A table comparing evaluations of Raw, XYZ, LAB and various RGB encoding exists in draft form.

A Technical Report is planned for 2013.

## TC8-10: Office lighting for imaging

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

Chair: Dr. Yasuki Yamauchi

No report presented at the meeting. The following is a repeat of last year:

A reference light source fixture, for use in comparing measurements to the common reference, has been constructed and circulated to test locations in US, Europe, and Asia. A detailed experimental procedure to use for measuring office illumination characteristics has been written and used in a US, European and Asian locations. The data collected so far has been evaluated with the result that confidence is gained in the measurement procedure and in the value of the reference light source.

Circulation of the reference light source was re-scheduled, and it completed after getting 4 new data in US/Canada, 6 in EU (Switzerland, Netherland, France and Germany). Oceania and Africa are the last two world areas that are not measured. As for the measurement in Oceania, it is going to be scheduled. As for the measurement in Africa, the Chair is planning to contact the CIE President.
Discussion on how to analyze the data has been started. Due to the Chair's unexpected move from industry to academia, the activity of TC has been unfortunately slowed down. The initial trial for categorizing the data into several groups has been done, and it was reported in Green's talk at AIC, but it has not discussed in detail.
Moreover, no progress has been made in how to use the measurement data obtained with a reference light source. It is assumed that the same light source, which served as a standard, should always emit consistently, it is possible to calibrate each measurement instrument by compensating the data.

## TC8-11: CIECAM02 Mathematics

Terms of Reference:
To improve CIECAM02 model to avoid the mathematical inconsistencies; to enable CIECAM02 to work in colour management applications.

Chair: Changjun Li (GB).

At the fall 2009 meeting, the Chair of Changjun Li gave an overview of the history of the committee, including the work of Gill, Süsstrunk, and Brill. Then, M. Mahy gave a presentation on the feasibility regions in chromaticity space for test and reference colors under various conditions.
The following was decided as the way forward:

1. A new version of CIECAM02 with the HPE primaries used in place of any version of CAT02 should be vetted. Then, the documentation of the model should be rewritten to reflect the simplification. (Several matrix operations will go away.)
2. The corresponding-color data sets that were used to validate CAT02 should be compared with the predictions of HPE-based chromatic adaptation to discover how much change is made in prediction quality relative to CAT02.
3. Graeme Gill's CIECAM02 modifications should be reviewed and tested. Starting from any point in the valid domain (inside the spectrum locus), if one uses HPE adaptation, one will never encounter most of the pathologies noted by Gill. However, the model may still benefit from Gill's repair of the post-adaptation infinite-slope problem:

Tasks 1 and 2 were carried out and results are summarised in the following two papers :
Changjun Li, M Ronnier Luo and Zhifeng Wang, Different Matrices for CIECAM02, draft version, 2011.
Changjun Li, M Ronnier Luo and Pei-Li Sun, A New Version of CIECAM02 with the HPE Primaries, submitted to CGIV 2012.

For the next activities, Graeme Gill's CIECAM02 modifications should be reviewed and tested along with the use of HPE matrix. Also, the "yellow-blue" and "purple" problems were raised by Brill & Susstrunk in 2008. They gave a solution to the first problem and pointed out the CIECAM02 problem could be overcome by solving the two problems simultaneously. Currently, there are some promising results and it can be expected the problem can be solved in the next year.

A Technical Report is planned for 2013.

## TC8-12: HVS-based quality assessment for video imaging Video Compression Assessment

Terms of Reference:

To establish and report on the display and viewing conditions and materials for video compression quality evaluation in different applications including, but not limited to, web, mobile phones, HDTV, home cinema and digital cinema.

Chair: Christine Fernadez-Maloigne (FR).

The overarching project name is HAVPQoS (End-to-end Hybrid Audio-Video Perceived Quality of Handheld Services).
The project is addressing the following key issues:

- Scalability.
- Audio–Video coding, adaptation and transcoding.
- IPMP and digital right management.
- Network QoS to Perceived QoS mapping
- End-to-end Perceived QoS (subjective test methodologies and objective implementation).

The activities in finalization currently are:

- A web site to be linked to CIE division 8 website : http://www.sic.sp2mi.univ-poitiers.fr/imagequality
- A report about quality assessment of compressed sequences for digital cinema
- A report about Benchmark of quality metrics on compressed images databases

## *4- Reporterships*

### R8-09 Output Linearization Methods for Display and Printers

### Prof.. Klaus Richter

Files corresponding to publications and test charts have been put on a server at the University of Berlin and can be accessed at http://130.149.60.45/~farbmetrik .

## *5- Canadian Participation*

| | |
|---|---|
| Byron Jordan | TC8-10 |
| J. A. Veitch | TC8-10 |

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

Canadian National Committee Comité National Canadien

# 57th Annual CNC/CIE Meeting
# 2012–November–30

# CNC/CIE WORKSHOP: OPPORTUNITIES AND CHALLENGES IN ENERGY EFFICIENT LIGHTING

NRC·CNRC
Institute for National Measurement Standards • Institut des étalons nationaux de mesure • Ottawa, Canada, K1A 0R6, Fax (613) 952-1394

# Opportunities and Challenges in Energy-Efficient Lighting

**CNC/CIE Workshop 2012**

**Friday November 30, 2012**

**Toronto, Ontario**

**Improving the CIE Color Rendering Index – How This Can Be Done and Why it Matters** – Lorne Whitehead

**Solar-Powered LED Exterior Lighting** – André Laperrière

**What Will It Take To Achieve Energy-Efficient Residential Lighting?** – Terry McGowan

**Standard Test Methods for High-Brightness LEDs** – Nathalie Renaud, INO

**CSA Sustainability and Energy-Efficiency Activities in Lighting** – Namat Elkouche

**North American and International Standardization Activities, and LED Marketing** – Howard Wolfman

**Panel Discussion: Opportunities and Challenges for Lighting Manufacturers in Canada** – Jennifer Veitch (Moderator), Shirley Coyle, Tung Yung Wang, Howard Yaphe