



CIE 2021

Midterm Meeting & Conference

27 – 29 September 2021

Organised by:



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

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Letter of Invitation

Welcome to CIE 2021

It is our pleasure to invite you to the CIE Midterm Meeting, which is hosted by the CIE National Committee of Malaysia (MyCIE) in Kuala Lumpur, Malaysia.

The CIE Midterm Meeting includes the conference CIE 2021, which runs from September 27 to 29, 2021. This three-day conference brings together the CIE community and its stakeholders together to advance the science of light and lighting and the technical and organizational work of the CIE.

With strong technical and scientific foundations, the CIE is an independent, non-profit organization that serves its member countries and the global community. Originally formed in 1900 as the International Commission on Photometry (CIP), and restructured as the CIE in 1913, the Commission is globally accepted as representing the best authority on all aspects of light and lighting. The CIE is recognized by the International Commission for Weights and Measures (CIPM), the International Standardization Organization (ISO) and the International Electrotechnical Commission (IEC) as an international standardization body.

The broad theme of the CIE 2021 conference is “Light for Life – Living with Light”. We especially invite abstract submissions on the topics:

Light in Culture and Heritage;
Urban Lighting Light and Ecology;
Integrative Lighting;
Colour and Lighting in Virtual Reality; and
Horticultural Lighting.

Of course, we also invite submission on topics related to all of the CIE Divisions: Vision and Colour; Physical Measurement of Light and Radiation; Interior Environment and Lighting Design; Transportation and Exterior Applications; Photobiology and Photochemistry; and, Image Technology.

The conference presents the perfect opportunity for all interested in the arts and sciences of light and lighting, from science, engineering, design and industry, to come together to discuss their interests with like-minded professionals from the global lighting community.

In line with the current uncertainties associated with the ongoing COVID-19 pandemic, this Midterm Meeting will be held completely online. For this online event MyCIE are partnering with a PCO to bring all participants the best online experience.



Peter Blattner
CIE President



Narendren Rengasamy
MyCIE Chairman

LOC Chairman's Foreword



"Selamat Datang" and Welcome to CIE 2021 Midterm Meeting and Conference!

The International Commission on Illumination - also known as the CIE from its French title, the Commission Internationale de l'Éclairage - is devoted to worldwide cooperation and the exchange of information on all matters relating to the science and art of light and lighting, colour and vision, photobiology and image technology.

It had been a challenging year with the Covid-19 Pandemic and plenty of rearrangements and rescheduling were done to our scheduled conference. And now, here we are, adopting the IR 4.0 in advance of the others with a fully virtual conference hosted by the Malaysia International Commission on Illumination, (MyCIE), with near to 30 countries participation.

I would also like to take the opportunity to thank all the Local and International Organising Committee Members including the International Scientific Committee for your tremendous support and efforts, working hand in hand in making this conference a successful one.

It is my sincere hope that at the end of this Conference, the participants would have gained a better insight on the topics, which involves in lighting and image technology of today. The technical sharing and presence of esteemed experts from all around the world would definitely enrich our knowledge and experiences.

I am confident that CIE 2021 Midterm Session will be a huge success and that participants will have the opportunity to renew contacts, interact and exchange ideas and experiences for their personal development as well as for the progress of the respective profession. Finally, I hope that the proactive initiative and cooperation in organising CIE 2021 will continue to receive your full support for future activities of our organisation and profession.

On behalf of the organising committee, we hope all of you will have a fruitful discussions and deliberation during the three-day conference, and we wish you a pleasant “surfing” experience in our first in CIE's History Virtual Platform!

Lim Sai Seong
Local Organising Committee, Chairman

About MyCIE



A National Committee of CIE for Malaysia was formed to fulfil the requirement of CIE as a Country Member. A formal application was sent to the CIE Central Bureau on 15th May 2009. Malaysia has been officially accepted as National Committee of CIE on 26th May 2009.

TEEAM has initiated and formalised the Malaysian National Committee of CIE (NCCIE) with the support of the government through Standards Malaysia. TEEAM hosts and facilitates the Secretariat of Malaysia CIE (MyCIE).

Malaysia CIE (MyCIE) is the working Committee that carries out the project works. MyCIE consists of interested parties from the industry and universities. It is a platform for them to reach out to international forum.

The technical activities of Malaysia CIE are carried out under the responsibilities of the seven divisions and facilitated by the respective division heads as listed below:

Division 1: Vision and Colour (headed by Lim Sai Seong)

Division 2: Physical Measurement of Light and Radiation (headed by Mohd Azmeer Ahmad)

Division 3: Interior environment and lighting design (headed by Lee Chia How)

Division 4: Transportation and Exterior Applications (headed by Lim Swee Yoong)

Division 6: Photobiology and photochemistry (headed by Vineetha Kalavally)

Division 8: Image technology (headed by Mohammad Faizal Ahmad Fauzi)

Division 5&7: (Divisions closed down and activities distributed to the other divisions)

TEEAM President's Message



A very warm Welcome and “Selamat Datang” to all the distinguished delegates who are attending the prestigious CIE 2021 Midterm Meeting & Conference from 27 – 29 September 2021, hosted by MyCIE - the Malaysia National Committee of International Commission on Illumination. Due to the on-going COVID-19 pandemic, this global event has to be hosted fully online from Kuala Lumpur, Malaysia. The Electrical and Electronics Association of Malaysia (TEEAM) is pleased to extend our fullest support to this esteemed lighting industry event.

This 3-day Meeting and Conference brings together the CIE community and its stakeholders, as well as all in the lighting profession to come together to advance the science of light & lighting, and the technical & organisational work of the Commission. The CIE is globally accepted as representing the best authority on all aspects of light and lighting.

This year's Conference with the theme “Light for Life – Living with Light”, presents the perfect platform for all interested in the arts and sciences of light and lighting, from science, engineering, design and industry, to come together to discuss their interests with like-minded professionals from the global lighting community. I believe this prestigious event brings ample networking and abundant business opportunities to all.

I wish all delegates will have a memorable and successful Meeting and Conference. My best wishes to the continuous success of the CIE community in all its future endeavours.

Let's make lives better through the art & science of light & lighting!

Siew Choon Thye

President

The Electrical and Electronics Association of Malaysia (TEEAM)



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International Scientific Committee

Jennifer Veitch	CA	NRC, CIE VPT, ISC Chair
Vineetha Kalavally	MY	Monash University, MyCIE LOC
Mohammad Faizal Ahmad Fauzi	MY	Multimedia University, MyCIE LOC
Youngshin Kwak	KR	Ulsan University, Director D1
Li-Chen Ou	TW	NTUST, Secretary D1
Tony Bergen	AU	Photometric Solutions International, Director D2
Dong-Hoon Lee	KR	KRISS, Secretary D2
Joanne Zwinkels	CA	NRC, D2 Management Team
Peter Thorns	GB	Zumtobel, Director D3
Claudia Amorim	BR	Universidade de Brasilia
Dionyz Gasparovsky	SK	University of Bratislava, Director D4
Sermin Onaygil	TR	Istanbul Technical University, D4 Management Team
Steve Fotios	GB	Sheffield University, D4 Management Team
Luc Schlangen	NL	Eindhoven University, Director D6
Po-Chieh Hung	US	Apple, Director D8
Christine Fernandez-Maloigne	FR	Universite de Poitiers, D8 Management Team
Peter Zwick	DE	CIE Technical Manager
Kathryn Nield	AT	CIE General Secretary

Review Panel

Vineetha Kalavally	MY	Monash University, MyCIE LOC
Youngshin Kwak	KR	Ulsan University, Director D1
Li-Chen Ou	TW	NTUST, D1 Management Team
Tony Bergen	AU	Photometric Solutions International, Director D2
Dong-Hoon Lee	KR	KRISS, Secretary D2
Joanne Zwinkels	CA	NRC, D2 Management Team
Peter Thorns	GB	Zumtobel, Director D3
Claudia Amorim	BR	Universidade de Brasilia
Dionyz Gasparovsky	SK	University of Bratislava, Director D4
Sermin Onaygil	TR	Istanbul Technical University, D4 Management Team
Steve Fotios	GB	Sheffield University, D4 Management Team
Luc Schlangen	NL	Eindhoven University, Director D6
Po-Chieh Hung	US	Apple, Director D8
Peter Hanselaer	BE	KU Leuven, D1 Management Team
Yoko Mizokami	JP	Chiba University
Gael Obein	FR	Le cnam
Tobias Schneider	DE	Instrument Systems
Adrie de Vries	NL	Signify
Veronica Garcia Hansen	AU	Queensland University of Technology (QUT), D3 Management Team
Martine Knoop	DE	TU Berlin
Nozomu Yoshizawa	JP	Tokyo University Of Science, D4 Management Team
Nigel Parry	GB	Orange Tek, D4 Management Team

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International Organising Committee



Peter Blattner
CIE President



Luoxi Hao
CIE Vice-President Publications



Jennifer Veitch
CIE Vice-President Technical



Kathryn Nield
CIE General Secretary



Narendren Rengasamy
CIE NC Malaysia Chairman

Local Organising Committee



Lim Sai Seong
Chairman



Glenn Tiong Chak Lim
Co-Chairman



Narendren Rengasamy
Committee Member



Lim Swee Yoong
Committee Member



Vineetha Kalavally
Committee Member



Mohammad Faizal Ahmed Fauzi
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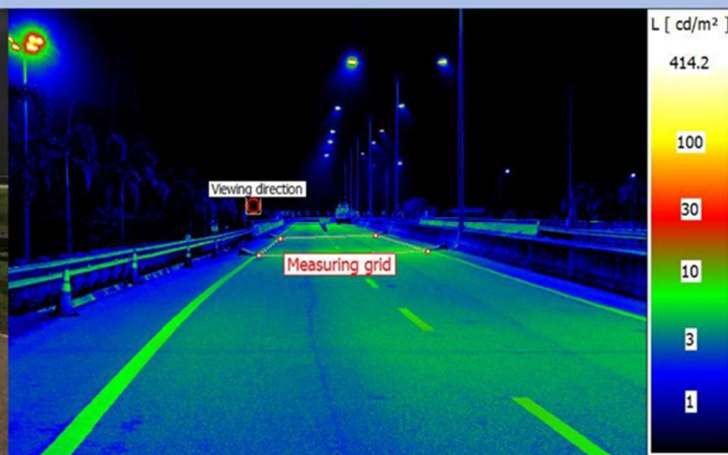


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- 2) Testing in compliance to Suruhanjaya Tenaga, MYHIJAU, JKR ,TNB , CE, US EPA and Energy Star requirements.
- 3) Approbation services (Import and Export) for Malaysia local market and International Market.
- 4) Onsite measurement in accordance to MS 825, CIE 140 and CIE 115.



Invited Speaker



Yvonne de Kort

“AN INTEGRATIVE PERSPECTIVE ON DYNAMIC LIGHTING,
AND HOW IT SHOULD BE STUDIED”

Yvonne de Kort is professor Contextual aspects of Human-Technology Interaction / Environmental Psychology at Eindhoven University of Technology, The Netherlands. She investigates the effects of light and natural views on human functioning. With her group, she investigates effects of lighting conditions on mental state (e.g., vigilance, vitality), behaviour (e.g., performance) and health-related phenomena (e.g., physiology, sleep), combining psychology, chronobiology, engineering and neuroscience.

Her group has become internationally recognized as a competent group with a unique expertise on the crossroads of light, psychology, biology/neurosciences and technology. They have chosen their niche as experts in effects of light and light exposure for day-active people. Their research agenda is translational and integrative. The research has resulted in numerous publications, many of which in high quality journals in the different relevant domains. Yvonne is program manager in TU/e's Intelligent Lighting Institute and coordinator in the strategic alliance on technical and social innovation for mental health care between TU/e, Tilburg University and GGzE, a regional mental health care organization. She is involved in multiple European and nationally funded projects and particularly proud to coordinate LIGHTCAP - a European Training Network under the Marie Skłodowska-Curie ITN framework, which combines the strengths of 7 international academic groups and prepares 15 PhD students to become innovative researchers in the domain of light effects on human functioning.

Invited Speaker



Edward Nardell

“VIRAL PANDEMICS: WHY GERMICIDAL UV AIR DISINFECTION IS ESSENTIAL”

Dr. Nardell's early career as a pulmonologist at the Cambridge Hospital, with an academic focus on tuberculosis, initially domestic TB, as TB Control Officer at various times for Boston, Cambridge, and the Commonwealth of Massachusetts.

In 2005 he left the Massachusetts DPH, and subsequently Cambridge Hospital, to delve into global TB control in Dr. Paul Farmer's Division of Global Health at Brigham & Women's Hospital, to guide MDR-TB treatment in Peru and Russia, and to pursue TB transmission research in a human-to-guinea pig transmission facility in South Africa. There, with colleagues, he systematically studied TB transmission and the impact of such interventions as upper room UV air disinfection, air filtration machines, masks on patients, immunization of the animals, and many other studies. At the same time, he headed a Fogarty research training program focused on airborne transmission.

Most recently he has been engaged in Covid-19 transmission research, responding to increased demand for germicidal UV research, including converting the South African facility into a human-to-hamster covid-19 transmission facility unit to test a variety of interventions.

Invited Speaker



Warren Julian

“SKYLIGHT AND SUNLIGHT; THE FORGOTTEN LIGHT SOURCES”

Emeritus Professor Warren Julian is past-Dean and Director of Lighting Studies, Faculty of Architecture, Design and Planning, University of Sydney; Life Fellow of the Illuminating Engineering Society of Australia and New Zealand (IESANZ); Honorary Fellow of the Society of Light and Lighting (SLL, UK); past-President IESANZ; Editor, Lighting; past Vice-Presidents (Technical and Publications) CIE; Chair, Standards Australia’s Interior Lighting Committee; Co-founder and Chair, Lux Pacifica; and author of over 250 scientific papers, articles, book chapters and books on lighting-related subjects.

His interests are all matters concerning light and lighting in Australia, the region and internationally. In 1979 he established the Master of Design Science (Illumination), the first graduate level lighting design program in English. His research interests are in how people respond to the lit environment and he has undertaken major studies in the gloom effect, discomfort glare and lighting for the partially sighted.

For his services to illumination engineering, particularly in education and research; to educational administration and to professional associations he was invested as a Member of the Order of Australia (AM) in the Queen’s Birthday Honours in 2011.

Invited Speaker



Annika Jagerbrand

“MEASURES FOR REDUCING THE ADVERSE EFFECTS OF ARTIFICIAL LIGHT AT NIGHT: INTER-DISCIPLINARY DEVELOPMENT AND PROGRESS”

Annika received her PhD in ecology from Göteborg University in 2005 and currently holds a position as an assistant professor in environmental science at Halmstad University in Sweden. Previously Annika held a position as an assistant professor in lighting science at Jönköping University.

Annika has been leading research projects on road lighting for over ten years and is a highly experienced multi-disciplinary researcher. She has authored 96 scientific publications and several dozens of popular papers.

Annika’s research interests include the ecological impact of LED lighting and measures against unwanted ecological impacts of light, light pollution, lighting design, sustainability, energy efficiency and traffic safety. She is an experienced lecturer in both environmental science and lighting science.

Annika has also worked several years as a consultant on environmental questions, for example, the impact of artificial lighting on protected species and habitats.

Within the CIE Annika is Chair of TC 4-61 “Artificial Lighting and its Impact on the Natural Environment”, and serves as a member of several other CIE TCs.

Invited Speaker



Constantinos Bouroussis

“MEASURES FOR REDUCING THE ADVERSE EFFECTS OF ARTIFICIAL LIGHT AT NIGHT: INTER-DISCIPLINARY DEVELOPMENT AND PROGRESS”

Constantinos is an Electrical and Computer Engineer. He received his PhD in Engineering in the field of road and tunnel lighting measurements from the National Technical University of Athens (NTUA). He is currently a research associate at the Lighting Laboratory of NTUA, with participation in more than thirty internationally and nationally funded projects. He also works as an independent technical consultant and previously he was a member of the committees and lead author for the preparation of a Greek Technical Guide on Road Lighting and the Greek National Regulation for Road and Tunnel Lighting.

His main areas of interest include lighting technology, photometry, imaging sensors, machine vision, and unmanned aerial systems. He has extensive experience in lighting measurements and evaluation of lighting infrastructures, lighting master planning, lighting education, instrument prototyping and other. He has given numerous lectures in lighting related aspects at universities and training institutes.

Costis participates in the CIE as the country member for Greece in Division 2. He is the Chair of TC 2-95 “Measurement of obtrusive light and sky glow”, is a reporter in Division 4 (DR 4-53 “Environmental Aspects of Obtrusive Light from Outdoor Lighting Installations”) and is a member of several other CIE TCs

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Time (MYT)	Programme		
10:00 - 14:00	Exhibitions, Posters, Casual Networking, MyCIE		
14:00 - 14:15	OPENING Opening Note, Peter Blattner, CIE President Welcome Note, Narendren Rengasamy, MyCIE Chairman		
14:15 - 15:15	INVITED SPEAKER IP01 Yvonne de Kort, NL An Integrative Perspective On Dynamic Lighting, And How It Should Be Studied		
15:15 - 15:30	BREAK		
15:30 - 17:00	OS1 Road Surfaces (D4) Chair: Dionyz Gasparovsky, SK	OS2 Integrative Lighting 1 (D3/D6) Chair: Adrie de Vries, NL	OS3 Visual Appearance (D1/D8) Chair: Po-Chieh Hung, US
15:30 - 15:45	OP01: Valérie Muzet, FR Is It Possible To Achieve Quality Lighting Without Considering The Photometry Of The Pavements?	OP05: Myrta Gkaintatzi Masouti, NL Validation Of Spectral Simulation Tools For The Prediction Of Indoor Electric Light Exposure	OP10: Shoma Amari, JP Modelling Of Perceptual Gloss By Physical Measurement Of Flat Surface
15:45 - 16:00	OP02: Celine Villa, FR Characterisation Of Luminescent Road Markings	OP06: Veronica Garcia Hansen, AU Capturing The Luminous Environment In Hospital Rooms: An Overview Of Occupant-Centered Methods To Inform Design Practice	OP11: Xiaoyi Zhu, JP Effect Of Light Source Distance On The Discrimination And Gloss Perception Of Paper
16:00 - 16:15	OP03: Laure Lebouc, FR Influence Of Road Surfaces On The Calculation Of A Target Visibility Taking Into Account The Direct And Indirect Lighting	OP07: Yukie Miura, JP Examination Of Psychological Effects And The Additivity Assumption In The Stress Evaluation Of Chromatic LED Lightings	OP12: Riho Ogawa, JP Colour Perception Of LED Point Light Sources In Scotopic Vision
16:15 - 16:30	OP04: Florian Greffier, FR How To Take Into Account The Heterogeneity Of Optical Properties Of A Pavement In Lighting Design?	OP08: Henrika Pihlajaniemi, FI Design Framework For Lighting And Occupational Well-Being In Underground Spaces: Case Study In Pyhäsalmi Mine	Discussion
16:30 - 17:00	Discussion	Discussion	Discussion
17:00 - 17:30	BREAK FOR SUPPER/LUNCH/DINNER/MORNING TEA/BREAKFAST		
17:30 - 19:00	OS4 Measurement Theory (D2)	WS1 Integrative Lighting Activities and Applications Conveners: Peter Thorns, GB / Luc Schlangen, NL	WS2 Adaptive Road Lighting Convener: Dionyz Gasparovsky, SK
17:30 - 17:45	OP13: Thorsten Gerloff, DE An Overview Of Important Factors To Consider When Calibrating LEDs In Photometry With Different Detectors		WP01: Constantinos Bouroussis, GR A Holistic Method For The Commissioning And Optimisation Of Adaptive Road Lighting Systems Using Laboratory And Field Measurements

The Organisers reserve the right to make changes and amendments to the programme and arrangement without prior notice.

Time (MYT)	Programme		
17:45 – 18:00	OP14: Benjamin Ruggaber, DE Degree Of Equivalence Of Tristimulus Values Of LEDs Under Consideration Of Measurement Uncertainty And Correlation		WPO2: Dionyz Gasparovsky, SK Assessment Of Road Lighting Performance For Traffic Intensity And Traffic Detection Based Lighting Adaptation
18:00 – 18:15	OP15: Forrest Webler, CH Spectral Measurement And Classification In The Era Of Big Data		
18:15 – 19:00	Discussion		
19:00 – 19:15	BREAK		
19:15 – 20:45	OS5 Integrative Lighting 2 (D3/D6) Chair: Luc Schlagen, NL	WS3 Tutorial on Enhancement of Images for colour-deficient observers Convener: Po-Chieh Hung, US	WS4 Practical determination of sampling interval in photometry and radiometry Convener: Tony Bergen, AU
19:15 – 19:30	OP16: Steffen Hartmeyer, CH Towards A Framework For Light-Dosimetry Studies: Methodological Considerations		
19:30 – 19:45	OP17: Mihai Husch, RO New Antimicrobial Strategie Using Compositions With Photocatalytic Properties		
19:45 – 20:00	OP18: Janine Stampfli, CH The Light Dosimeter – A New Device To Help Advance Research On The Non-Visual Responses To Light		
20:00 – 20:15	OP19: Manuel Spitschan, GB LUOX: Novel Open-Access And Open-Source Web Platform For Calculating And Sharing Physiologically Relevant Quantities For Light And Lighting		
20:15 – 20:45	Discussion		
20:45 – 21:00	BREAK		
21:00 – 22:00	INVITED SPEAKER IPO2 Edward Nardell, US Viral Pandemics: Why Germicidal UV Air Disinfection Is Essential		
22:00 – 23:00	Networking Event Trivia Session Hosted by: Tony Bergen (AU), Vineetha Kalavally (MY), Peter Thorns (GB)		
23:00 – 00:00	Access Lobby Access to prerecorded presentations from day before Access to poster paper booths		

The Organisers reserve the right to make changes and amendments to the programme and arrangement without prior notice.

Day 2

Time (MYT)	Programme		
00:00 - 14:00	Access Lobby Access to prerecorded presentations from day before Access to poster paper booths		
14:00 - 15:30	OS6 Glare (D3) Chair: Peter Thorns, GB	OS7 Daylight (D3) Chair: Martine Knoop, DE	OS8 Temporal light modulation (D1/D2) Chair: Qian (Cherry) Li, CN
14:00 - 14:15	OP20: Simon Martin, BE Daylight Glare Probability Prediction For An Office Room	OP24: Gizem Izmir Tunahan, GB The Role Of Daylight In Library Users' Seat Preferences	OP27: Paul Dekker, NL Facility For Calibration Of Photometers For Temporal Light Modulation
14:15 - 14:30	OP21: Sneha Jain, CH On Sensitivity To Glare And Its Relationship With Macular Pigment	OP25: Yuki Oe, JP Effects Of The Triple Split Window Screen On Visual Privacy And View In The Residential Living Space	OP28: Anders Thorseth, DK Sensitivity Analysis On The Effect Of Measurement Noise And Sampling Frequency On The Calculation Of The Temporal Light Artefacts
14:30 - 14:45	OP22: Geraldine Quek, CH User Evaluations Of Contrast-Dominant Discomfort Glare In Dim Daylit Scenarios: Preliminary Findings	OP26: Francisca Rodriguez, AU Adaptations To Subjective Instruments For Dynamic View Assessment Evaluation	OP29: Naomi Miller, US Definition Modifications For Temporal Light Modulation ("Flicker")
14:45 - 15:00	OP23: Gilles Vissenberg, NL A Generic Glare Sensation Model Based On The Human Visual System	Discussion	Discussion
15:00 - 15:30	Discussion		
15:30 - 15:45	BREAK		
15:45 - 17:15	WS5 Methods for measuring discomfort from glare Convener: Steve Fotios, GB	WS6 Pre-Vitamin D Action Spectrum: Challenging CIE Towards A Standard Convener: Ann Webb, GB	WS7 Revision Of ISO/CIE 19476 And CIE S 025 Convener: Armin Sperling, DE
			WPO3: Udo Krüger, DE General V(A) Mismatch Index - History, Current State, New Ideas
			WPO4 Ville Mantela, FI Novel Evaluation Method For General Photometer Mismatch INDEX FI'
17:15 - 17:45	BREAK FOR SUPPER/LUNCH/DINNER/MORNING TEA/BREAKFAST		
17:45 - 19:15	POSTER SESSION		

The Organisers reserve the right to make changes and amendments to the programme and arrangement without prior notice.

Time (MYT)	Programme		
19:15 – 20:15	INVITED SPEAKER IP03 Annika Jägerbrand, SE and Costis Bouroussis, GR Measures For Reducing The Adverse Effects Of Artificial Light At Night Inter-Disciplinary Development And Progress		
20:15 – 21:15	Networking Events 1. Fledgling Professionals Hosted by CIE President Peter Blattner (CH) and CIE VPT Jennifer Veitch (CA) 2. “A Taste of Malaysia” Virtual Cooking and Garden Tour Hosted by Sarah Khong - New Malaysian Kitchen Instructor (MY)		
21:15 – 22:45	OS9 Benefits and disadvantages of road lighting (D4) Chair: Sermin Onaygil, TR	OS10 Residential lighting (D3) Chair: Nozomu Yoshizawa, JP	OS11 Measurement equipment evaluation (D2) Chair: Thomas Reiners, DE
21:15 – 21:30	OP30: Maria Nilsson Tengelin, SE A Novel Method For Studying Threshold Levels For Positive Phototaxis In Insects	OP33: Cláudia Amorim, BR Lighting Conditions In Brazilian And Colombian Home Offices: A Preliminary Study Based On Occupant’S Perception	OP37:Yoshi Ohno, US IEA 4E SSL Annex Interlaboratory Comparison Of Goniophotometers Measuring Solid State Lighting Products – Results
21:30 – 21:45	OP31: Steve Fotios, GB Investigating Light And Crime Using Ambient Light Level	OP34: Banu Manav, TR Analyses On Occupant Patterns And Energy Consumption In Residential Buildings Including The Covid-19 Pandemic	OP38: Johannes Ledig, DE Nonlinearity Of Charge Accumulating Pixel Matrix Sensors Used In Imaging Luminance Measurement Devices
21:45 – 22:00	OP32: Chloe Robbins, GB Optimising Road Lighting To Reduce Road Traffic Crashes	OP35: Barbara Matusiak, NO Home Office Survey In The Scope Of The IEA SHC Task 61, The Lighting Conditions For Studentse	OP39: Kinza Maham, FI Methodologies To Measure Spatial Uniformities Of Integrating Spheres
22:00 – 22:15	Discussion	OP36: Rengin Aslanoğlu, PL An International Survey On Residential Lighting: Analysis Of Winter-Term Results	OP40: Florian Stuker, CH sensLAB: Testing Motion And Presence Sensors For Smart Lighting
22:15 – 22:45		Discussion	Discussion
22:45 – 23:45	Access Lobby Access to prerecorded presentations from day before Access to poster paper booths		

The Organisers reserve the right to make changes and amendments to the programme and arrangement without prior notice.

Time (MYT)	Programme		
00:00 - 14:00	Access Lobby Access to prerecorded presentations from day before Access to poster paper booths		
14:00 - 15:30	OS12 Measurement of materials and sources (D2) Chair: Gaël Obein, FR		WS8 Cone-fundamental-based colorimetry Convener: Lorne Whitehead, CA
14:00 - 14:15	OP41 Pablo Santafé-Gabarda, ES Evaluation Of The Bidirectional Scattering -Surface Reflectance Distribution Function For Different Levels Of Translucency		
14:15 - 14:30	OP42 Dipanjana Saha, FR Development Of A μ BRDF Goniophotometer For BRDF Measurement On Tiny Surfaces		
14:30 - 14:45	OP43 Yuqin Zong, US Accurate Measurement Of Ultraviolet Light-Emitting Diodes		
14:45 - 15:30	Discussion		
15:30 - 15:45	BREAK		
15:45 - 16:45	INVITED SPEAKER IP04 Warren Julian, Au Skylight And Sunlight, The Forgotten Light Sources		
16:45 - 17:45	Networking Events "A Date with Malaysia"- Old Kuala Lumpur - East West Connection Virtual 360 Tour Hosted by Jane Rai - Tour Guide (MY)		
17:45 - 19:15	OS13 Colour appearance models (D1/D8) Chair: Kaida Xiao, GB	OS14 Lit environment (D3) Chair: Veronica Garcia Hansen, AU	OS15 Road lighting metrics (D4) Chair: Steve Fotios, GB
17:45 - 18:00	OP44: Keyu Shi, CN Testing The Performance For Unrelated Colour Appearance Models	OP48: Hiroyuki Miyake, JP Quantification Of The Effect Of Lighting Environment On Spaciousness Of Interior Space	OP53: Ulrika Wänström, SE Impact Of Qualitative And Quantitative Methods On The Evaluation Of Street Lighting Uniformity
18:00 - 18:15	OP45: Ming Luo, CN Two-Dimensional Colour Appearance Scales For Colour Stimuli Having High Dynamic Range	OP49: Nozomu Yoshizawa, JP A Neurophysiology-Based Model To Estimate Visibility In Actual Lighting Environment	OP54: Alexander Basov, RU Numerical-Analytical Model Of The Luminance Factor Of An Arbitrary Surface

The Organisers reserve the right to make changes and amendments to the programme and arrangement without prior notice.

Time (MYT)	Programme		
18:15 – 18:30	OP46: Balázs Vince Nagy, HU Chromatic Discrimination Thresholds Observed In CAM02-UCS And CAM16-UCS	OP50: Musashi Koyama, JP Effects Of Luminous Colour Shift Duv On Colour Preference	OP55: Vincent Boucher, FR Keeping The Benefit Of ILM D's High Resolution In Measuring Lighting Quality Parameters
18:30 – 18:45	OP47: Ching-Ching Wu, TW Reference White In A Complex Virtual Reality Environment	OP51: Kei Suzuki, JP The Effect Of Lighting Environment On Facial Expression Perception In Video Teleconferencing	Discussion
18:45 – 19:15	Discussion	Discussion	Discussion
19:15 – 19:45	BREAK FOR SUPPER/LUNCH/DINNER/MORNING TEA/BREAKFAST		
19:45 – 21:15	OS16 Lighting trade-offs (D1) Chair: Yoko Mizokami, JP	OS17 Tools; Cultural concepts (D3) Chair: Cláudia Amorin, BR	OS18 Pedestrian-related issues (D4) Chair: Nigel Parry GB
19:45 – 20:00	OP56: Rugved Kore, US Damage Reduction With Maintained Colour Quality Of Artwork Under RGB Projector	OP60: Laura Bellia, IT Virtual Reality: A Promising Approach For Lighting Research	OP64: Khalidh Hamoodh, GB The Visual Cues Used To Evaluate Other Pedestrians; Face, Body, Or Something Else?
20:00 – 20:15	OP57: Suzuki Mizushima, JP The Diffuseness Of Illumination Suitable For Reproducing Object Surface Appearance Using Computer Graphics	OP61: Nima Baradaran-Razaz, SE How Building Information Modelling Can Support Increased Recycling Of Luminaires And Light Sources	OP65: Steve Fotios, GB Using Relative Visual Performance To Predict The Ability To Make Interpersonal Evaluations
20:15 – 20:30	OP58: Maha Ishihara, JP A Study On The Differences In Vision Between The Young And The Elderly In Signs	OP62: Hillevi Hemphaelae, SE Veram, A Subjective And Objective Visual Ergonomics Risk Assessment Method- A Descriptive Paper Of The Objective Risks	OP52: Belal Abboushi, US Illuminance At The Eye As A Simple Metric For Discomfort Glare From Pedestrian Scale Luminaires
20:30 – 20:45	OP59: Jennifer Veitch, CA Colour Fidelity And Illuminance Trade-Off: Testing Lighting Values	OP63: Gizem Izmir Tunahan, GB Conceptual Framework Of Cultural Background In The Lit Environment	Discussion
20:45 – 21:15	Discussion	Discussion	
21:15 – 22:15	CLOSING CEREMONY Interactive closing - How did the conference go? Quiz prizes, best student paper prize, best poster prize		

The Organisers reserve the right to make changes and amendments to the programme and arrangement without prior notice.

Time zones:

New Zealand: NZDT = MYT + 5 hours

Australia east coast: AEST = MYT + 2 hours

Central Europe: CEST = MYT - 6 hours

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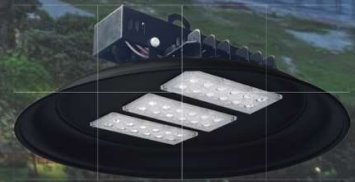
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Posters

D1: VISION AND COLOUR

P001	Cehao Yu	Netherlands	CHROMATIC LIGHT FIELD EFFECTS ON PERCEIVED MODELLING AND COLOUR HARMONY
P003	Dragan Sekulovski	Netherlands	TOWARDS AN AVIAN FLICKER VISIBILITY MEASURE
P004	Maria Nilsson Tengelin	Sweden	ARE THE DEMANDS IN ENTERTAINMENT LIGHTING TOO HIGH FOR WHITE LIGHT EMITTING DIODES?
P005	Aayush Bista	Nepal	OPTIMUM SPECTRUM OF LED LIGHTING FOR CULTURAL AND HERITAGE SITE: A CASE STUDY OF 15TH CENTURY WORLD HERITAGE SITE IN NEPAL
P006	Lorne Whitehead	Canada	DESIGN TRADE-OFFS FOR MULTI-PRIMARY BASED LIGHT SOURCES
P008	Yuki Akizuki	Japan	SPECTRAL TRANSMISSION AND SCATTERING CHARACTERISTICS OF HUMAN SKIN
P009	Yuki Kawashima	United States	PERCEIVED CHROMA AND HUE CHANGES OF COLOURS AT HIGH ILLUMINANCE LEVELS DUE TO HUNT EFFECT
P011	Yi-Ming Li	Chinese Taipei	VISUAL EFFECTS OF OBJECTS UNDER METAMERISM WITH MULTI-SPECTRAL LIGHT SOURCE
P012	Viktorii Rybina	Russia	APPLICATION OF A STATISTICAL APPROACH TO THE DESCRIPTION OF COLOUR PERCEPTION THRESHOLDS
P013	Yuwei Wang	United States	SUBJECTIVE EVALUATION OF VISUAL COMPLEXITY, CLARITY, AND PREFERENCE OF INDOOR ENVIRONMENTS

D2: PHYSICAL MEASUREMENT OF LIGHT AND RADIATION

P014	Vyacheslav Panin	Russia	DEVELOPMENT OF A METHOD FOR MEASURING PPFD DISTRIBUTION OVER THE TECHNOLOGICAL AREA OF A GREENHOUSE BY A MOBILE INSTALLATION
P015	Jianguan Pan	China	EVALUATION OF IMPEDANCE OF CABLES IN GONIOPHOTOMETRY
P017	Alexey Bartsev	Russia	ILLUMINANCE DISTRIBUTION MEASUREMENT OF MUSEUM EXHIBITS USING DIGITAL IMAGING LUMINANCE METER
P018	Constantinos Bouroussis	Greece	METROLOGICAL CHALLENGES IN MONITORING OF SKY LUMINANCE DURING DAY AND NIGHT BY USING LUMINANCE METERS AND RGB IMAGING SENSORS
P019	Petr Kliment	Czech Republic	UNFILTERED TRAP-BASED PHOTOMETER CALIBRATION
P020	Alejandro Ferrero	Spain	IMPACT OF THE NORMALIZATION OF THE SPECTRAL RESPONSIVITY ON THE PERFORMANCE OF THE GENERAL $V(\lambda)$ MISMATCH INDEX
P021	Philipp Schneider	Germany	HANDLING OF CORRELATIONS OF SPECTRAL QUANTITIES IN TRACEABILITY CHAIN – BASICS FOR A PYTHON-BASED ANALYSIS FRAMEWORK
P022	Tony Bergen	Australia	EXPERIMENTAL VALIDATION OF THE 200 NM LIMIT FOR MEASUREMENTS OF ULTRAVIOLET RADIATION IN AIR
P023	Oussama BEN ABDELLAH	France	THE CORRELATED COLOUR TEMPERATURE: AN INFLUENTIAL PARAMETER IN AGEING OLEDs
P024	Johannes Ledig	Germany	SIGNAL CHARACTERISTIC OF A CAMERA WITH AN INTEGRATING AMPLIFIER AND LOGARITHMIC ENCODING AT THE PIXEL LEVEL
P025	Armin Sperling	Germany	RevStdLED: A EUROPEAN PROJECT TO SUPPORT THE REVISION OF STANDARDS RELATED TO SOLID STATE LIGHTING
P026	Néstor Tejedor	Spain	MEASUREMENT OF NORMAL / HEMISPHERICAL REFLECTANCE BY GONIOSPECTROPHOTOMETRY
P027	Johannes Ledig	Germany	UNCERTAINTY OF THE SPECTRAL MISMATCH ERROR IN MEASUREMENTS OF WHITE LEDs WHEN REFERENCING THE LUMINOUS RESPONSIVITY TO AN LED REFERENCE
P028	David Lerch	Germany	GENERIC MODEL FOR GONIOMETER GEOMETRIES
P029	Igor Zhelezov	Russia	STUDY OF METHODS FOR MEASURING THE OPTICAL CHARACTERISTICS OF LOW-PRESSURE MERCURY LAMPS
P030	Dennis Corell	Denmark	COMPARISON OF LUMINOUS FLUX MAINTENANCE METHODS, CONTINUOUS VS. ON/OFF CYCLES
P031	Zhafirah Ajrina	Indonesia	CHARACTERIZATION AND ANALYSIS OF SPECTRAL REFLECTANCE OF VARIOUS INTERIOR MATERIALS DUE TO TUNABLE LED LIGHTING
P032	Brian HT LEE	Hong Kong	CALIBRATION OF SPECTRAL IRRADIANCE SOURCES USING A FIBER-COUPLED SYSTEM
P034	Alena Kuznetsov	Russia	OPTIMISATION OF A MOBILE METHOD FOR MEASURING ROAD LIGHTING CHARACTERISTICS (LUMINANCE AND ILLUMINANCE)
P035	Roman Dubnicka	Slovakia	INFLUENCE OF ROTATION ANGLE OF SQUARE LUMINAIRES ON MEASURED PHOTOMETRIC PARAMETERS OF INDOOR WORKPLACES
P036	Takara Tamura	Japan	ESTIMATION OF COMPLEX LIGHT DISTRIBUTION CHARACTERISTIC BASED ON LIGHT FIELDS

D3: INTERIOR ENVIRONMENT AND LIGHTING DESIGN

P037	Kevin Bertin	France	AN OVERVIEW OF THE IMPACT OF STRAY LIGHT FROM COMMERCIAL GREENHOUSES
P038	Barbara Matusiak	Norway	LESSONS LEARNED FROM REGISTRATION OF OCCUPANCY AND USE OF LIGHTING IN OFFICES, SCHOOLS, UNIVERSITIES AND INDUSTRY BUILDINGS, A CROSS COUNTRY
P039	Arjen Mentens	Belgium	OPTIMIZING CAMERA PLACEMENT FOR A LUMINANCE- BASED SHADING CONTROL SYSTEM
P040	Dorukalp Durmus	United States	A REAL-TIME INTEGRATIVE LIGHTING SYSTEM FRAMEWORK BASED ON MACHINE LEARNING
P041	Anna Pellegrino	Italy	HIEQLAB: A NOVEL FULL – SCALE FACILITY WITH OCCUPANTS TO INVESTIGATE INTEGRATIVE LIGHTING AND HUMAN PERFORMANCE IN A MULTI-DOMAIN
P042	Sevda Aliparast	Turkey	ARTIFIAL LIGHTING DESIGN WITH CONCEPT OF HUMAN CENTRIC LIGHTING CRITERIA IN CELL OFFICES
P044	Kairu Inoue	Japan	CREATING A SENSE OF THE UNUSUAL WITH CHROMATIC LIGHT
P045	Aya Maeda	Japan	EVALUATION STRUCTURE ON PREFERENCE OF PAINTING’S APPEARANCE WITH LOW REFLECTANCE IN THE MUSEUM LIGHTING ENVIRONMENT
P046	Ayana Medeiros	Brazil	THE LIGHT OF AMAZON ARCHITECT SEVERIANO MÁRIO PORTO
P047	Yukie Sasajima	Japan	SOFTNESS OF LIGHT PASSING THROUGH WINDOWS AND ITS RELATIONSHIP WITH LUMINANCE GRADIENT
P048	Alexandra Bartseva	Russia	DEVELOPMENT OF NEW STANDARDS FOR MUSEUM LIGHTING
P049	Tatiana Meshkova	Russia	SCALING OF SENSATIONS DURING THE PERFORMANCE OF VISUAL TASKS IN RELATION TO HUMAN CENTRIC LIGHTING
P050	Hikdei Yamaguchi	Japan	ISSUES AND COUNTERPLAN OF EVACATION CENTER AT NIGHT - CASE STUDY OF NORTHEN GYMNASIUM IN SUZAKA CITY AFFECTED BY TYPHOON HAGIBIS IN 2019 -
P051	Intisar Hussain	United Kingdom	COMPARING THE PRIVACY VS DAYLIGHT COMPROMISE FOR DIFFERENT WINDOW COVERINGS
P052	Tongyue Wang	China	EVIDENCE- BASED RESEARCH AND APPLICATIONS FOR HEALTH LIGHTING DESIGN IN UNIVERSITY CLASSROOMS
P053	Etsuko Mochizuki	Japan	FIELD SURVEY ON LIGHTING ENVIRONMENT FOR WORK FROM HOME IN JAPAN
P054	Roman Dubnicka	Slovakia	TEST TO ASSESS THE ACCURACY OF THE LIGHTING COMPUTER SOFTWARE WHEN DESIGNING ROOMS WITH WINDOWS
P055	Lorrain Caumon	France	COLOUR & LIGHT DESIGN: AMBIENCE AS AN ANSWER TO THE PROBLEMS OF A HEALTHY COLLECTIVE HOUSING
P056	Om Sagar Banjara	Nepal	INTEGRATION OF DAYLIGHT WITH ELECTRIC LIGHTING IN COMMERCIAL BUILDINGS: A CASE STUDY FROM NEPAL

Posters

D4: TRANSPORTATION AND EXTERIOR APPLICATIONS

P057	Guillaume Dotreppe	Belgium	TOWARDS AN IMPROVED V-VLC OPTICAL CHANNEL MODELLING
P059	Kai Feng	China	A LABORATORY STUDY ON VISUAL AND EMOTIONAL COMFORT EVALUATION OF LED WIDE BEAM ANGLE LAMPS : TAKING 3000K/ 4000K / 5000 K LINEAR LAMPS AS
P060	Steve Lau	China	THE IMPACT OF COLOURFUL AND DYNAMIC LED MEDIA FACADE AND BILLBOARDS ON ASTRONOMICAL OBSERVATIONS
P062	Annika Jägerbrand	Sweden	A REVIEW OF THE IMPACT OF LIGHT POLLUTION ON ECOSYSTEMS AND SKY BRIGHTNESS
P063	Jim Uttley	United Kingdom	THE EFFECT OF CHANGES IN LIGHT LEVEL ON THE NUMBERS OF CYCLISTS
P064	Tomas Novak	Czech Republic	MODELLING OF VERTICAL SURFACES RADIATION IN CONNECTION WITH THE EVALUATION OF THE OBTRUSIVE LIGHT
P065	Amira AbouElhamd	United Arab Emirates	USEFUL CONTRAST INDEX FOR ROADWAY LIGHTING STANDARDS

D6: PHOTOBIOLOGY AND PHOTOCHEMISTRY

P067	Ljiljana Udovicic	Germany	LIGHT EXPOSURE OF WORKERS IN DIFFERENT OCCUPATIONS
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