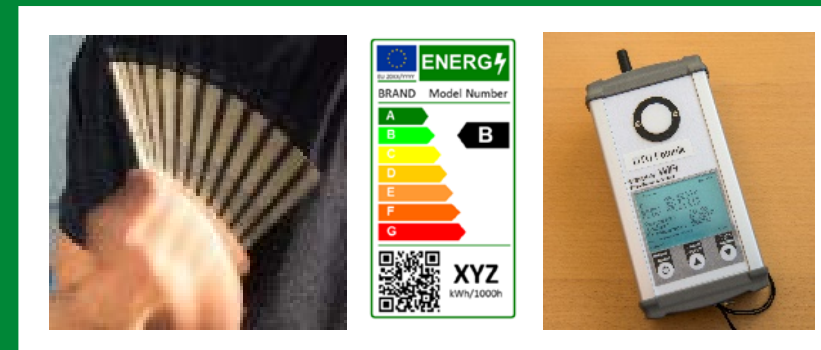


DTU



# Welcome



## 4<sup>E</sup> Solid State Lighting Annex Expert Seminar

Mandag den 7. oktober 2019, DTU Fotonik, Risø Campus



Energy piano



Energistyrelsen



Dansk Center for Lys

DTU Fotonik  
Department of Photonics Engineering

Carsten Dam-Hansen, DTU Fotonik

# Technical University of Denmark, DTU

founded in 1829 by Hans Christian Ørsted

11.500 students, incl. 1.300 PhD 1.600 int MSc

6000 publications

Risø founded in 1958, nuclear research

1985 Risø National Laboratory

2007 Fused with DTU

DTU Fotonik

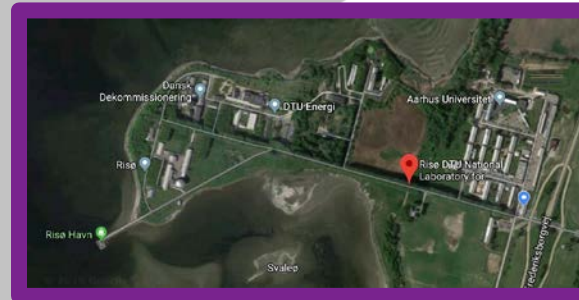
Department of Photonics Engineering

220 employees, 35 at Risø

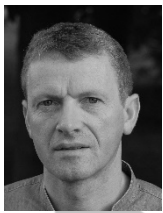
LED group and photometric laboratories



Main campus in Lyngby



Risø campus



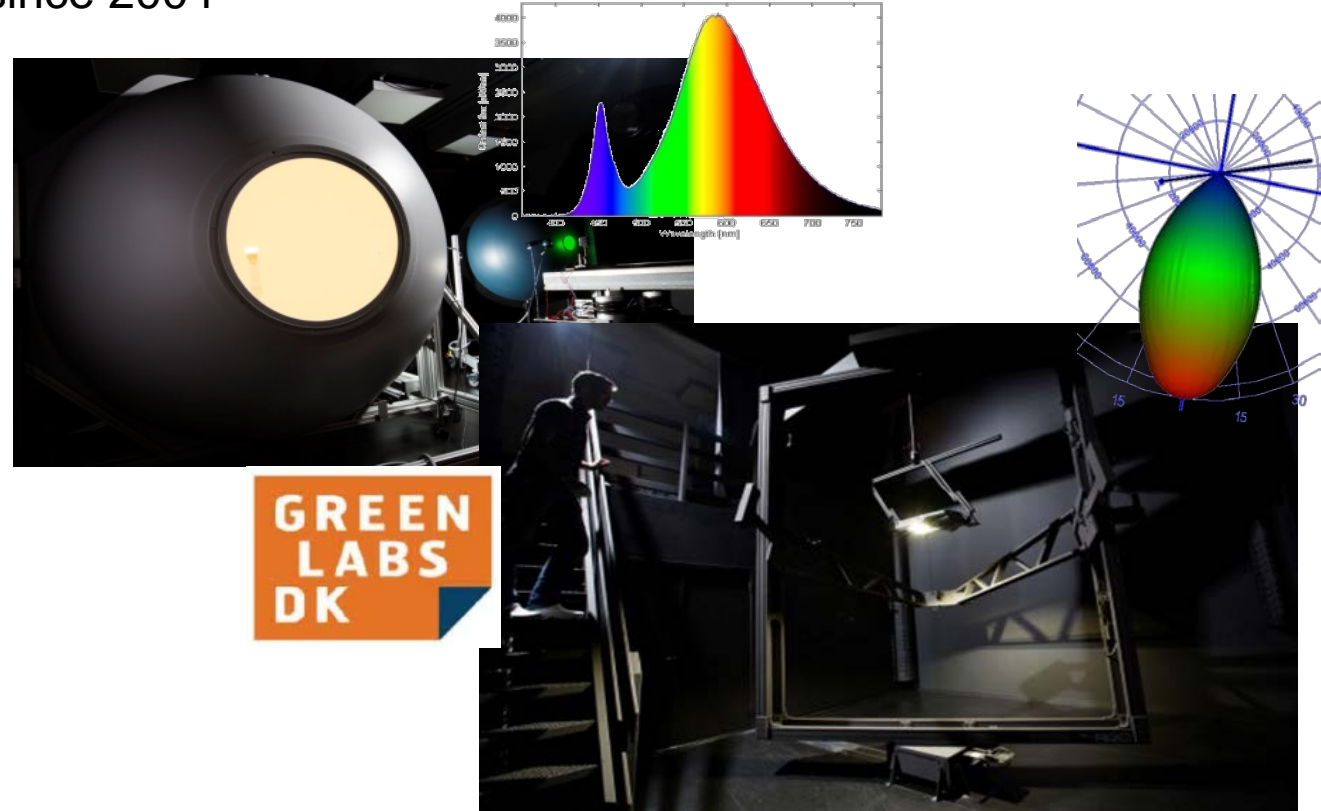
# LED group

Part of the Diode laser and LED systems research group

Working with R&D on LED technology, optical systems, lighting, characterization demonstration and lighting metrology since 2004

## Activities

- Photometric lab for research and education
- DOLL Greenlab for industry
- 50+ externally funded projects on research and innovation with LED, laser lighting, optical systems and lighting metrology





# LED group, international collaboration

Anders Thorseth is national representative for Division 2: Measurement of light and radiation

Active in technical committees and research forums  
RF-02 Matters relating to temporal light modulation



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



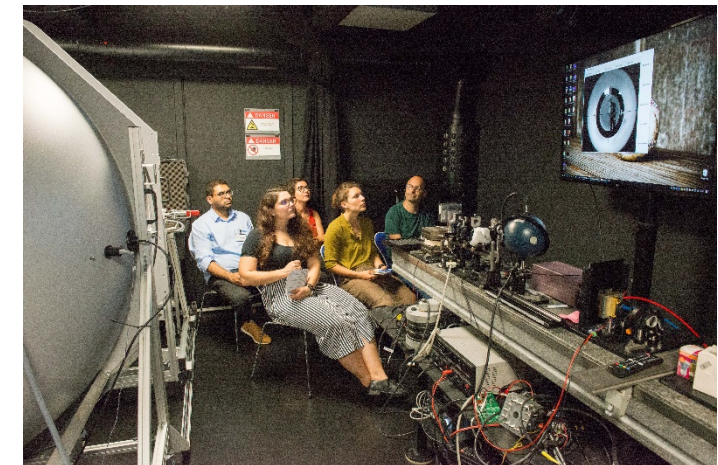
The EMPIR initiative is co-funded by the European Union's Horizon 2020 research and innovation programme and the EMPIR Participating States



Luminous flux and intensity LED standard lamps  
Sphere calibration and fisheye camera method



Stakeholder training,  
28 August 2019



# IEA SSL Annex

Working group under the International Energy Agency

Goal to accelerate the global adoption of high quality Solid state lighting

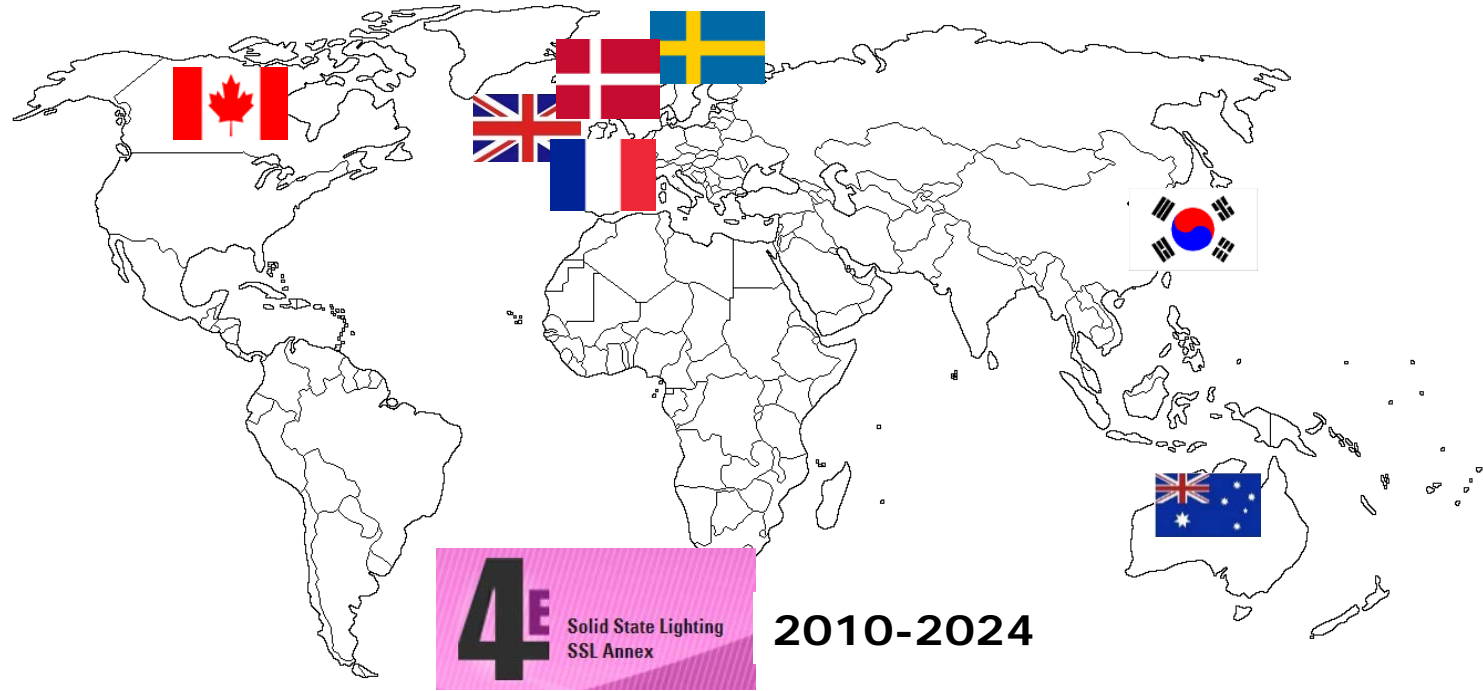
Denmark is member trough the Danish Energy Agency,

Casper Kofod, Energy Piano, Carsten Dam-Hansen, DTU Fotonik

Danish Lighting Center, Anne Bay

Annex meets every half year

the 19th expert meeting is in Copenhagen, 8-10 October



Supported by



# Recent International Research on LED Quality Metrics and New Lighting Regulations in Europe

Background new the EU Ecodesign and Energy Labelling package is adopted:

New demands for:

- Energy efficiency
- Flicker, stroboscopic visibility
- Endurance

With focus on this we will look at:



New research on health



Developments in product testing and metrology



Policy developments in Europe

## 4<sup>E</sup> Solid State Lighting Annex Expert Seminar

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European Commission - Press release

**New rules make household appliances more sustainable\***

Brussels, 1 October 2019

In a continued effort to reduce Europe's carbon footprint and to make energy bills cheaper for European consumers, the Commission today adopted new eco-design measures for products such



Energy piano



Energistyrelsen



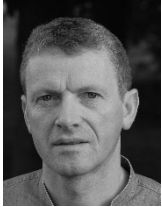
Energetnologisk udvikling og demonstration



DCL  
Dansk Center for Lys

DTU Fotonik  
Department of Photonics Engineering

# Contact



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# Programme

Time		Subject	Speaker
9.00	9.45	Registration and breakfast	
9.45	10.00	Welcome	<b>Carsten Dam-Hansen</b> , Senior Scientist, Diode Lasers and LED Systems, DTU Fotonik, Denmark
10.00	10.30	IEA 4E SSL Annex Overview: International governments cooperate on SSL performance and testing policies	<b>David Boughey</b> , Assistant Director – Lighting Energy Efficiency, Department of the Environment and Energy, Australia
<b>New research on Health</b>			
10.30	11.00	Health and environmental effects of LEDs, highlights from the new French Health Authority (ANSES) report	<b>Christophe Martinsons</b> , Head of Lighting and Electromagnetic Fields Division, CSTB, France
11.00	11.45	Temporal light modulation effects on visual perception, cognition, and comfort - Research in Canada and France	<b>Jennifer Veitch</b> , Principal Research Officer; National Research Council of Canada
11.45	13.00	Lunch break	

Policy Developments in Europe			
13.00	13.30	New EU ecodesign regulation for lighting – requirements and timing	<b>Peter Bennich</b> , Principal Adviser, Energy Efficiency, Swedish Energy Agency, Sweden
13.30	14.00	European product registry database and the new energy label for lighting	<b>Michael Scholand</b> , Operating Agent Support, IEA 4E SSL Annex
14.00	14.30	Coffee break	
Developments in Product Testing and Metrology			
14.30	15.00	LED lamp and luminaire lifetime and endurance testing	<b>Steve Coyne</b> , Director, Light Naturally, Australia
15.00	15.30	Temporal light modulation; testing of six LED lamp types from EU and Australia	<b>Christofer Silfvenius</b> , Swedish Energy Agency, Sweden
15.30	16.15	CIE S 025 test method and Interlaboratory Comparison 2017 (goniophotometers)	<b>Yoshi Ohno</b> , NIST Fellow, Sensor Science Division; NIST, USA
16.15	16.30	Thank you and closing remarks	<b>Anne Bay</b> , Danish Lighting Centre, Denmark
16.30	17.00	Visit the Photometric Labs at DTU	<b>Carsten Dam-Hansen</b> , Senior Scientist, Diode Lasers and LED Systems, DTU Fotonik, Denmark