

Non-visual effects of light

EUROSHNET Conference

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Commission for Occupational Health and
Safety and Standardization (KAN)

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Dresden, 12 June 2019

Light has non-visual effects – also at the workplace



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EUROSHNET
Anna Dammann
Dresden, 12 June 2019

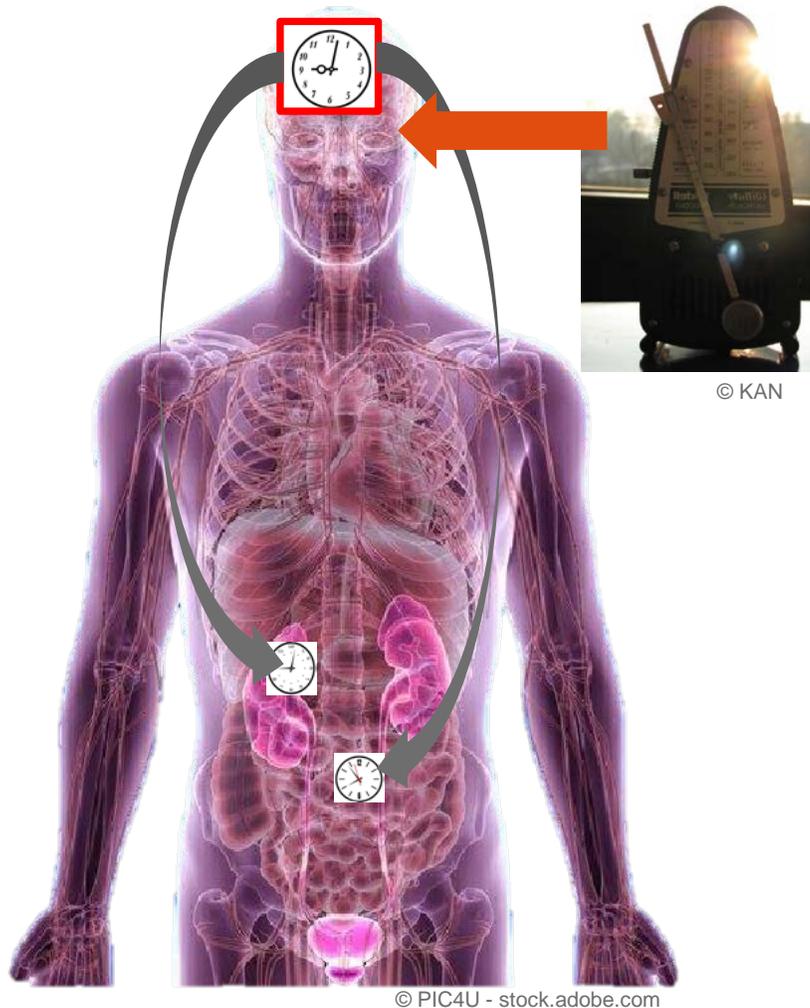


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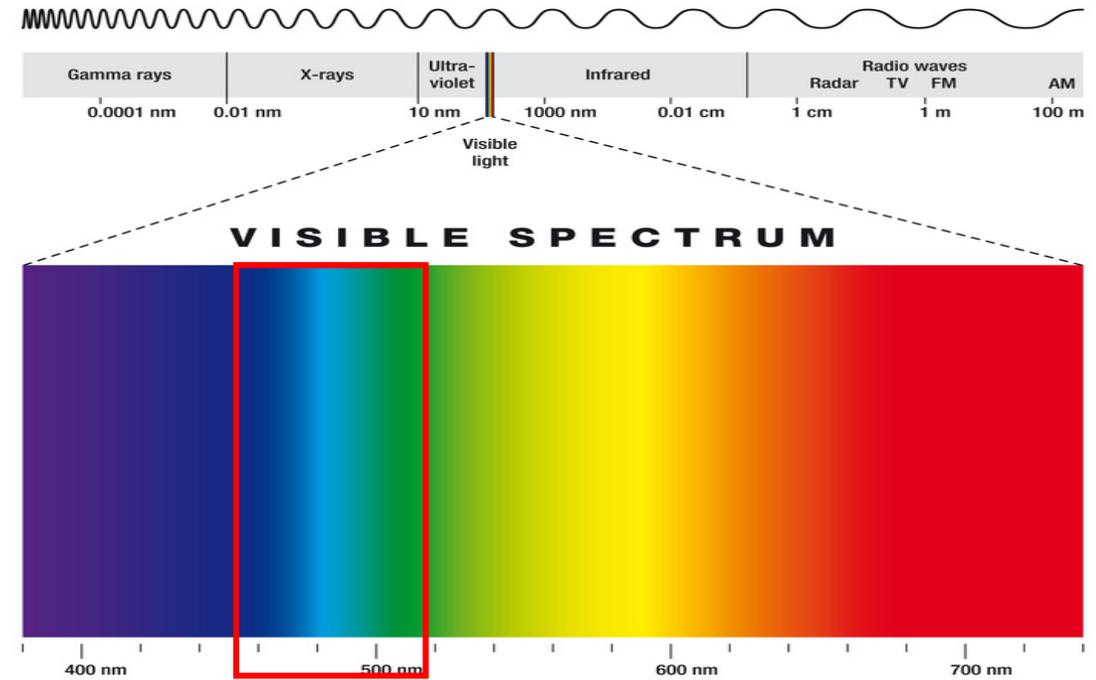
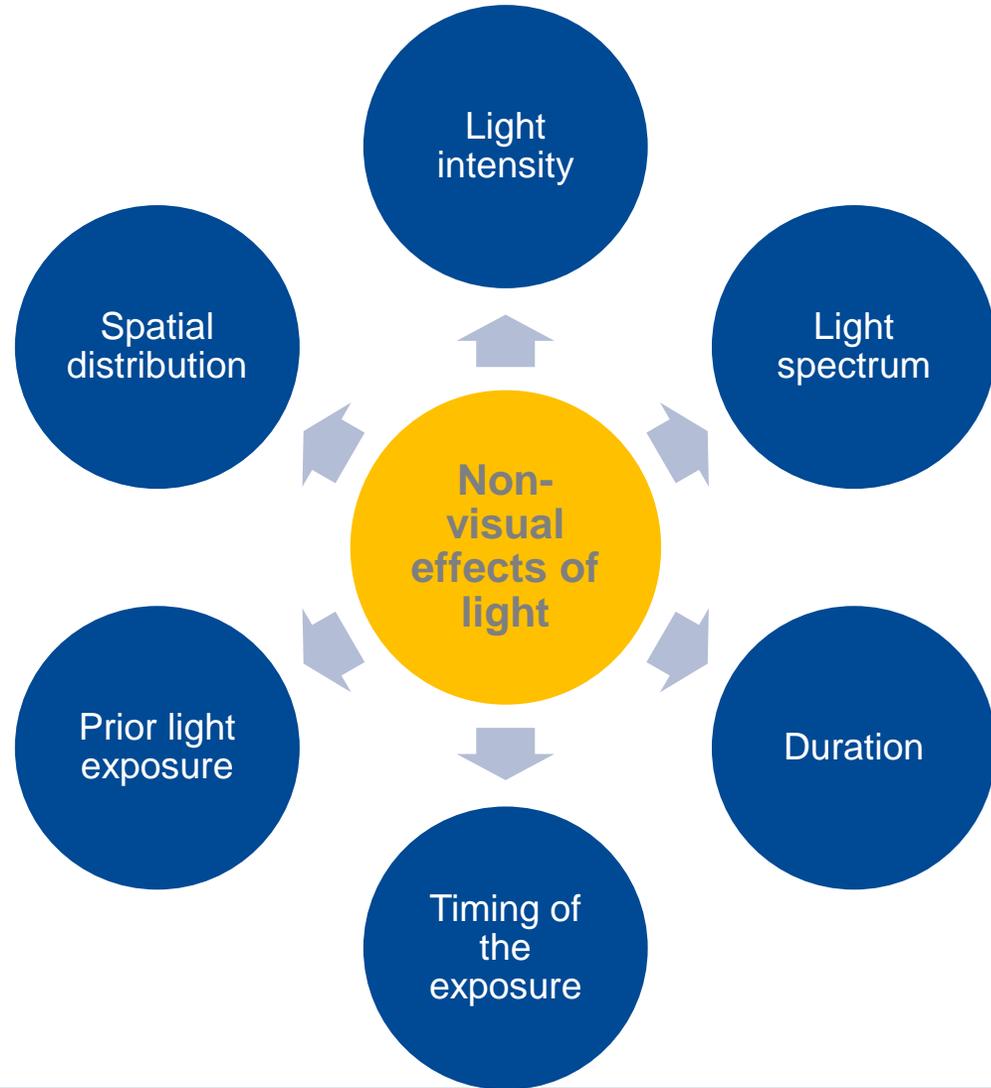
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Light as the metronome of our "inner clock"



- Light meets special receptors in the eye
- Light signals are forwarded to the "master clock"
- The master clock adjusts different rhythms to each other

Influencing variables



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Chronotype



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Standardization world – non-visual effects

DIN (Vornorm) 5031-100

*Definition and calculation of
melanopic sensitivity
functions*



DIN (Fachbericht) 67600
recommendations for use
→ *occupational health
and safety*



CIE S 026/E:2018

*Definition and calculation of
spectral sensitivity functions*

CEN/TR 16791

*Definition and calculation of
spectral sensitivity functions*

ISO/PDTR 21783

*Literature review
(in progress)*

What is occupational health and safety doing in Germany?

KAN

- **KAN position paper**
- Exchange of information (workshop)
- **Literature review** →

- Highlighting **findings** for OSH
 - Basis for formation of opinion with regard to **standardization**
 - Describe the need for **further research**
- www.kan.de/publikationen/kan-studien/

Government committee (AStA)

- Recommendation published

German Social Accident Insurance (DGUV)

- **Information paper** published



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What do you take with you?

- Daylight has priority for illuminating workplaces
- New lighting systems which specifically trigger the non-visual effects of light are already on the market
- Any light can cause these effects unplanned
- Proper light at the right time strengthens the inner clock

- Pay attention to the inner clock (lark or owl?)
- Light is also effective in your free time:
go out during lunch breaks and outside working hours!



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Light dosimeter - recording an individual's light history

EUROSHNET Conference

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Dresden, 12 June 2019

Approach

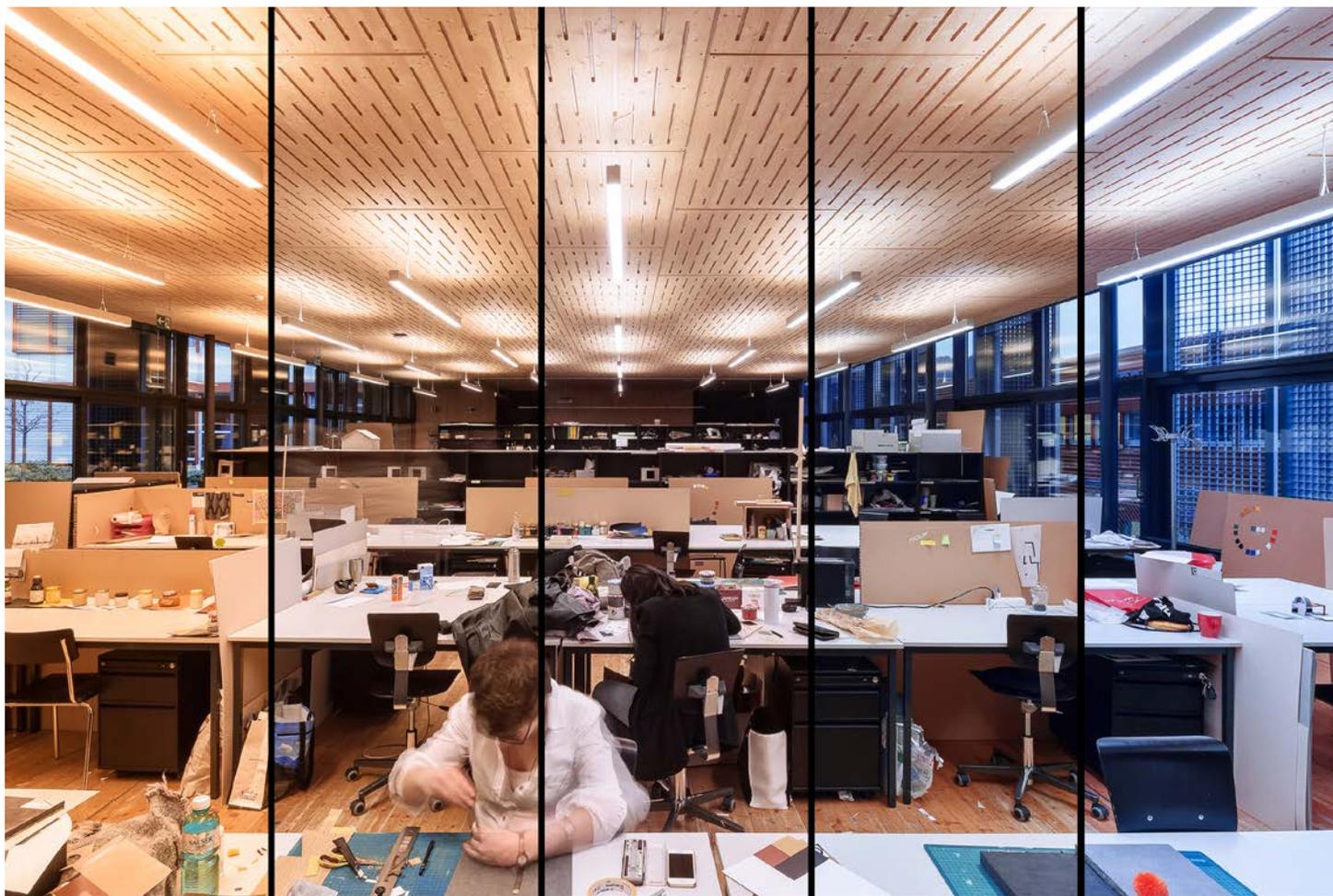


Photo: Reto Häfliger

- Daylight has priority
- New lighting systems
- Unplanned effects
- The inner clock
- Light is also effective in your free time

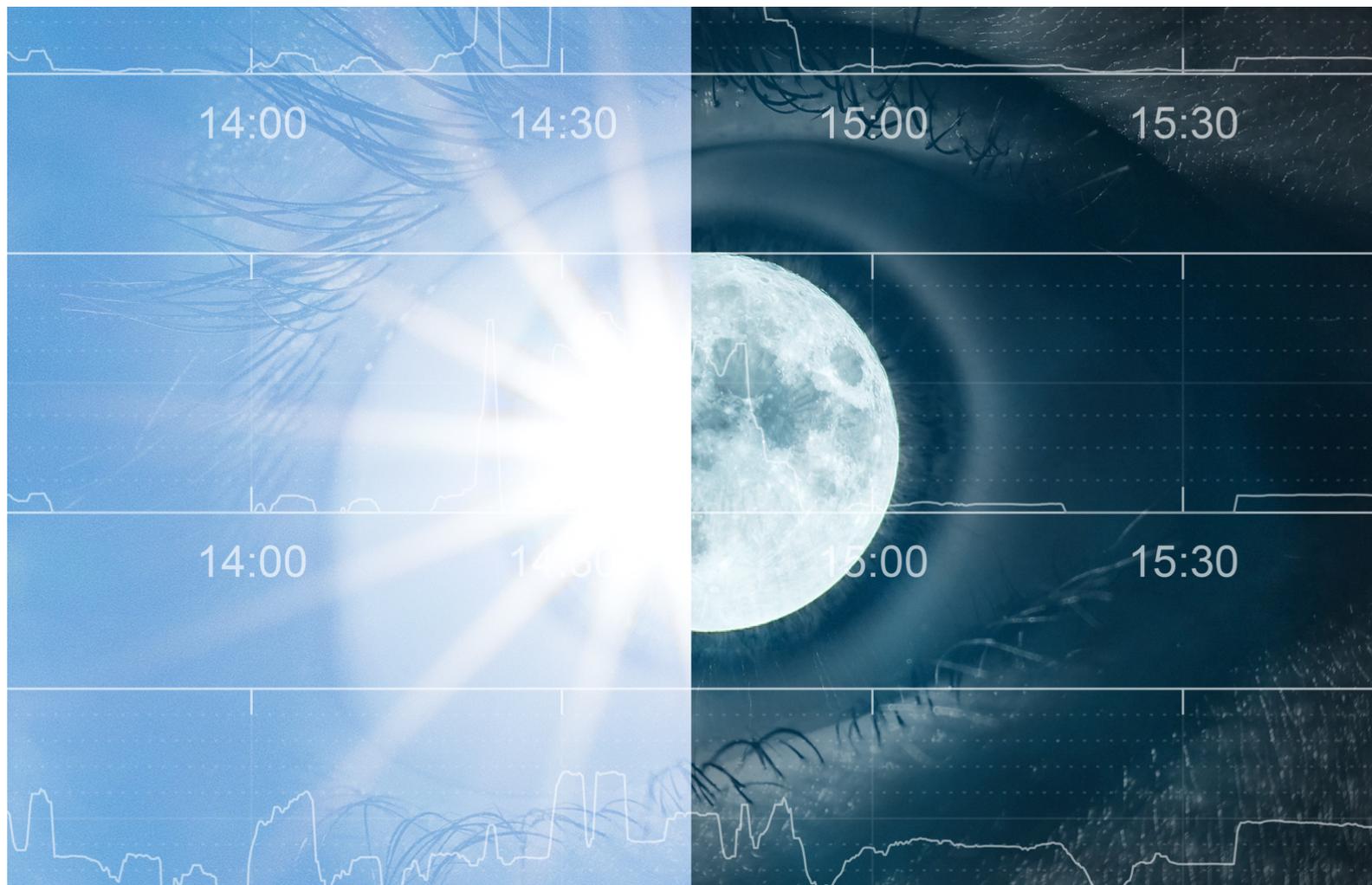
**Each person has a
‘Light History’, i.e. the
light/dark patterns
experienced in the past**



Measuring and recording light

*“Measure what is measurable,
and make measurable what is
not so.”*

Light-Dosimeter2.0



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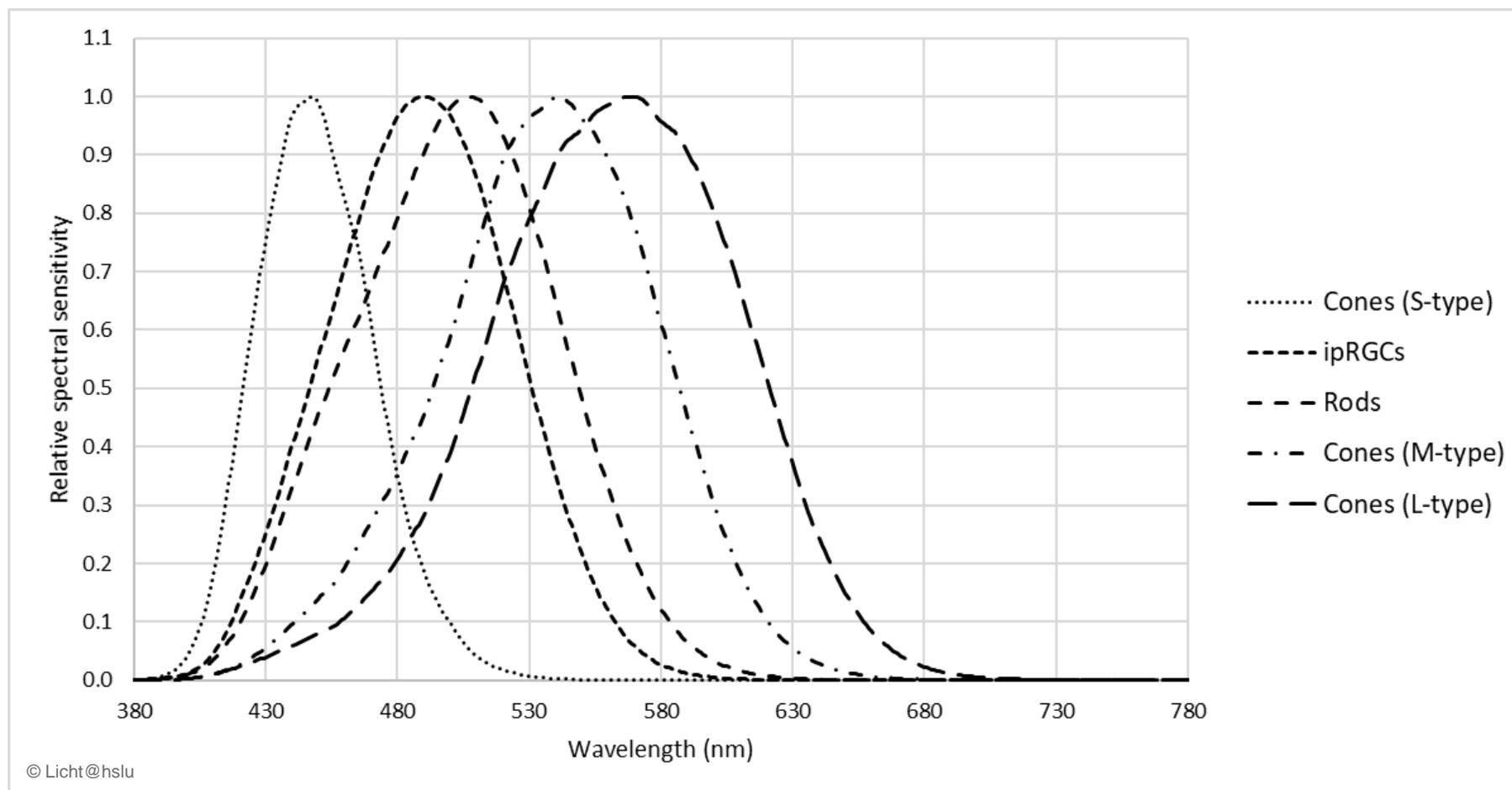
Funded by

VELUX STIFTUNG

Project partner:

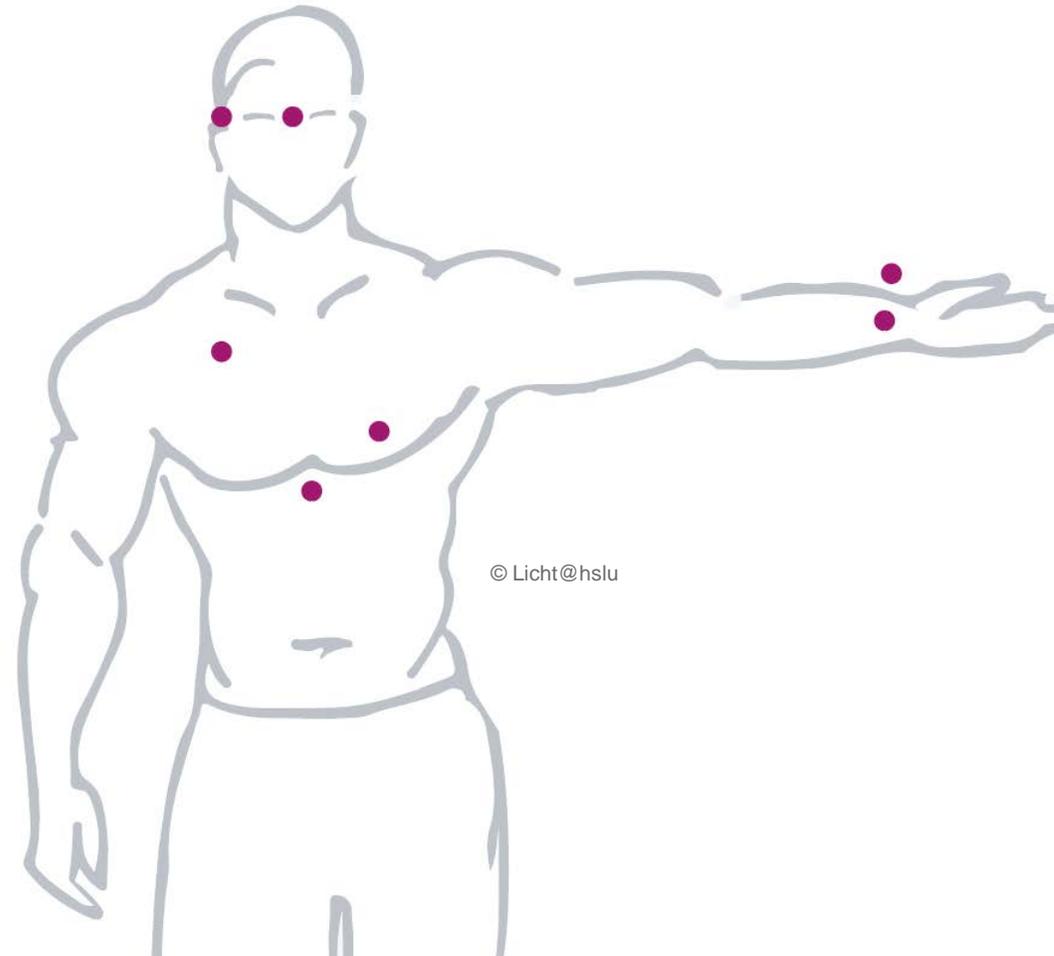
- An interdisciplinary team from the Lucerne University of Applied Sciences and Arts with a background in light and lighting, electrical engineering, building services engineering, product design and economics
- Centre for Chronobiology, Psychiatric Hospital of the University of Basel
- Swiss Federal Office of Metrology, Bern
- Munich University of Applied Sciences, “Light and Health”, Munich

CIE S 026/E:2018 - CIE System for Metrology of Optical Radiation for ipRGC-Influenced Responses to Light

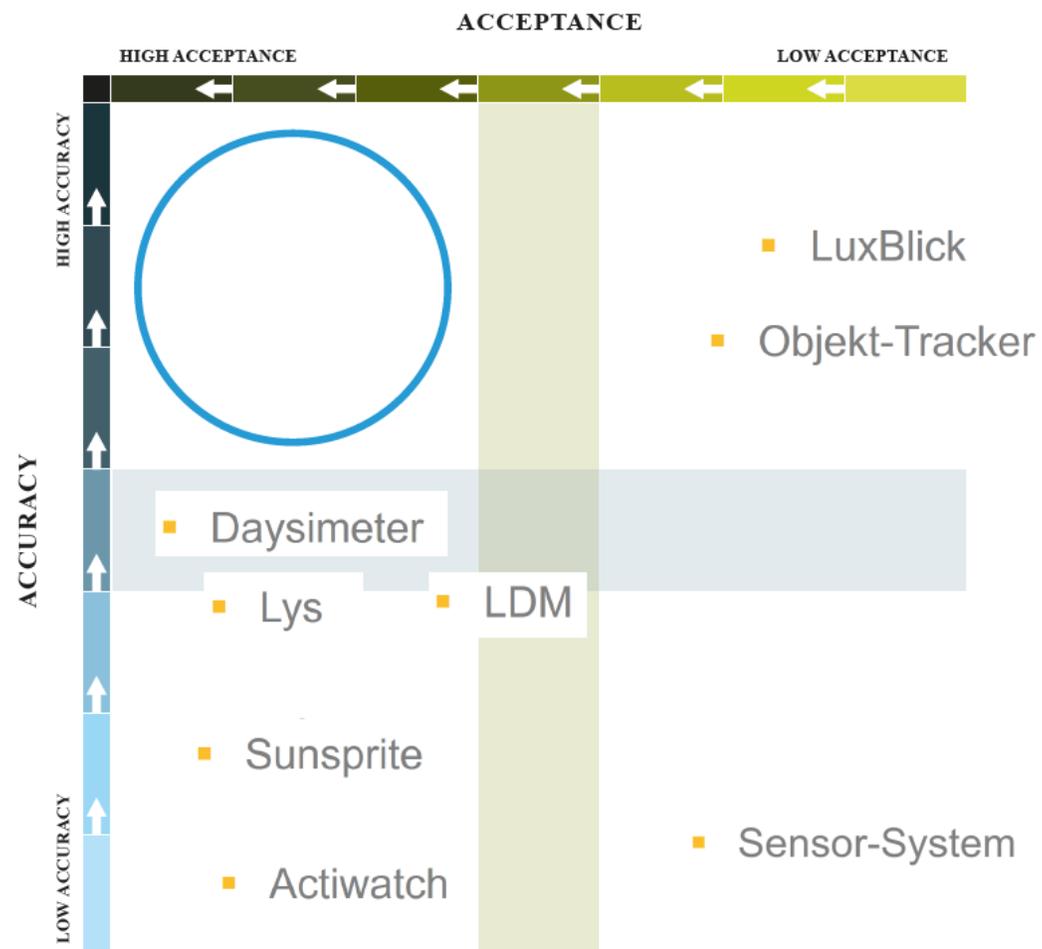


Existing devices

- Actiwatch
- ActTrust
- Daysimeter
- DimeMeter
- LDM Lichtdosimeter (HSLU)
- LuxBlick
- Lys
- Objekt-Tracker
- Sensor-System
- Sunsprite



Carrying positions

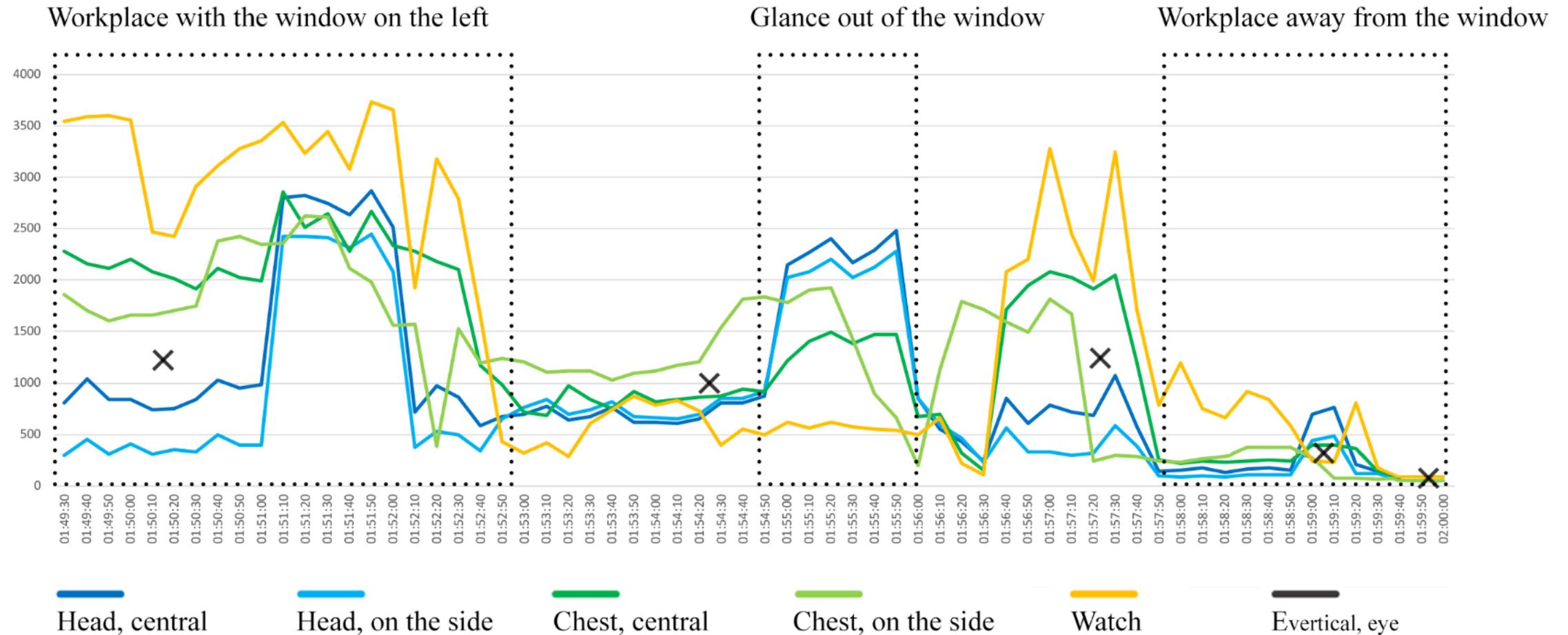


It is a trade-off between

- Accuracy
- Acceptance

In turn, accuracy depends not only on the carrying position, but also on other factors, such as type of light sensor, measurement frequency, user-friendliness and design.

Example



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Summary

- Light has visual and non-visual effects
- Agreement reached in 2018 on the measures to be used
- Measuring and recording light over time is not standard yet
- The carrying position is a trade-off between accuracy and acceptance
- First prototypes available late 2019 / early 2020

We would love to hear from you.
Please get in touch!

Or visit the project website:
www.light-dosimeter.ch

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