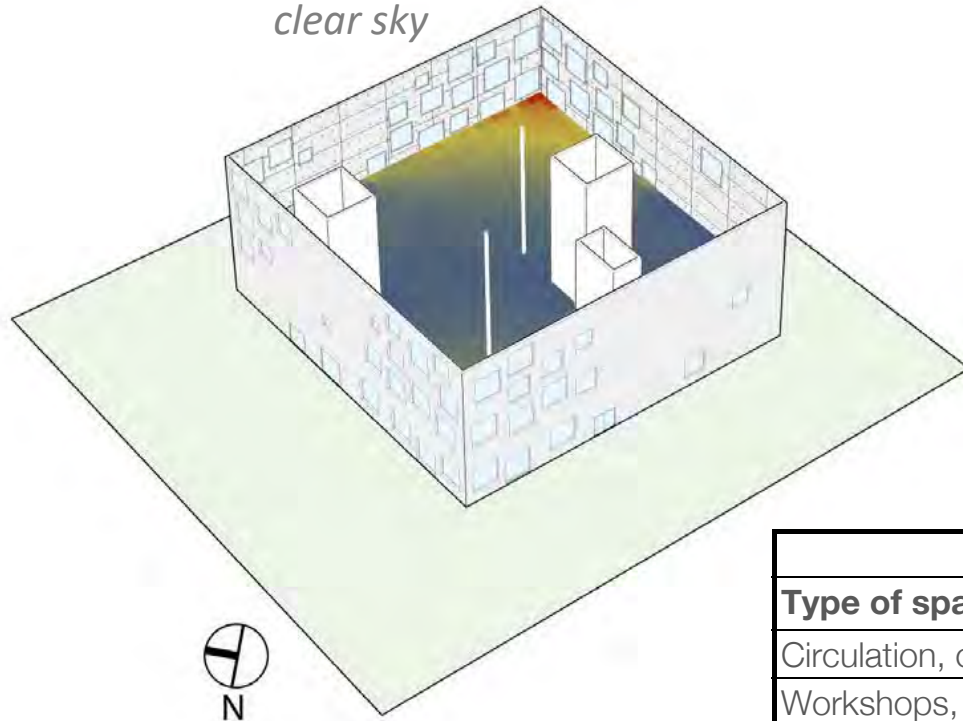


«measuring» daylight

illuminance (lux)
 February 27, 1:30pm
 clear sky



Task illumination metrics

instantaneous

- illuminance (lux)

Full moon



0.01 lux

Overcast sky



8'000 - 20'000 lux

Sunny sky

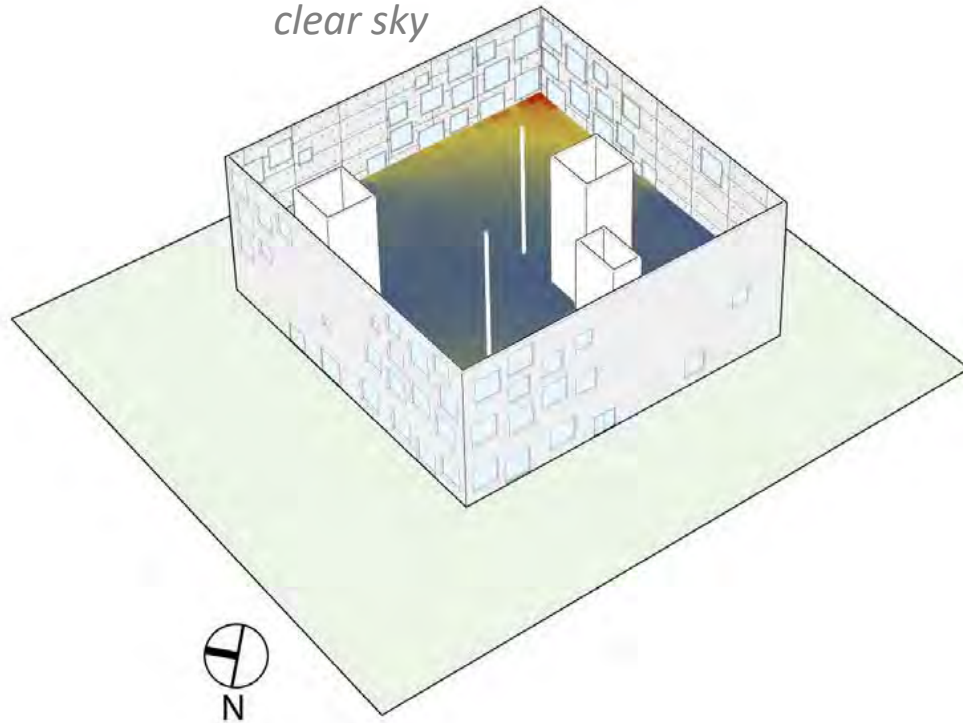


30'000 -100'000 lux

Type of space and function	Illuminance [lux]		
	Min	Mid	Max
Circulation, corridors, theatres...	50	100	200
Workshops, retail centres ...	200	300	400
Schools, offices, writing, computer work...	300	400	500
Delicate work, drawing, technical tasks...	500	750	1000
Precision workshops, visual quality control	1000	to	5000

«measuring» daylight

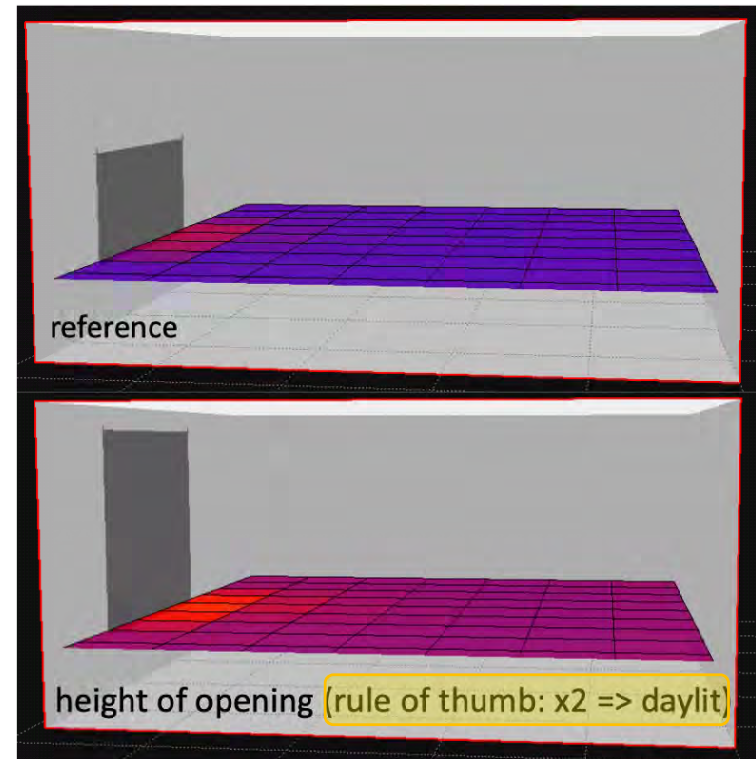
illuminance (lux)
February 27, 1:30pm
clear sky



Task illumination metrics

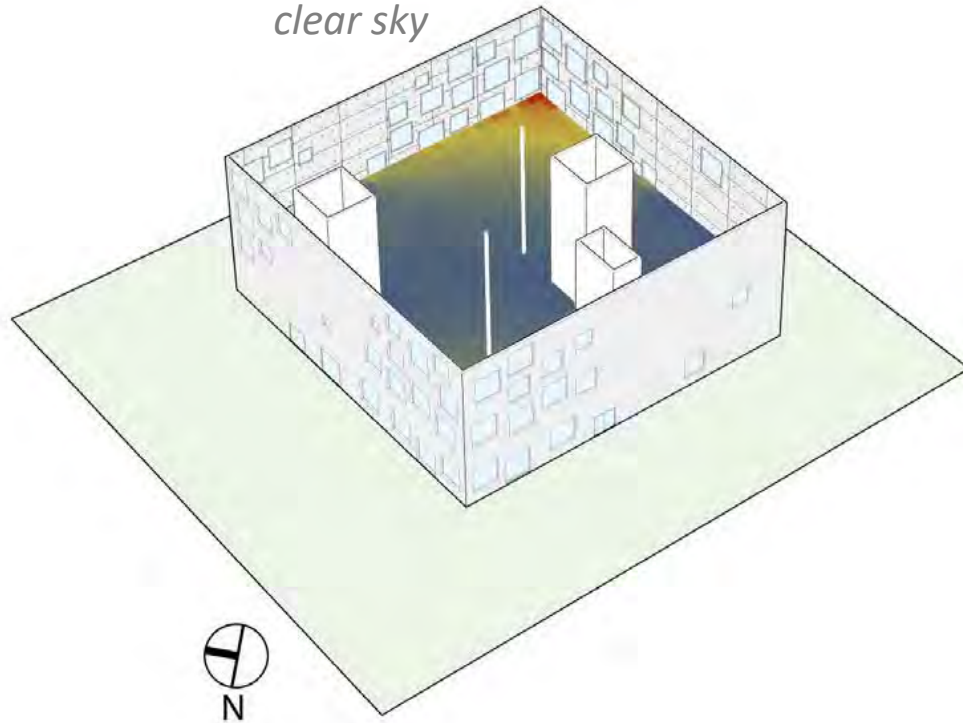
instantaneous

- illuminance (lux)



«measuring» daylight

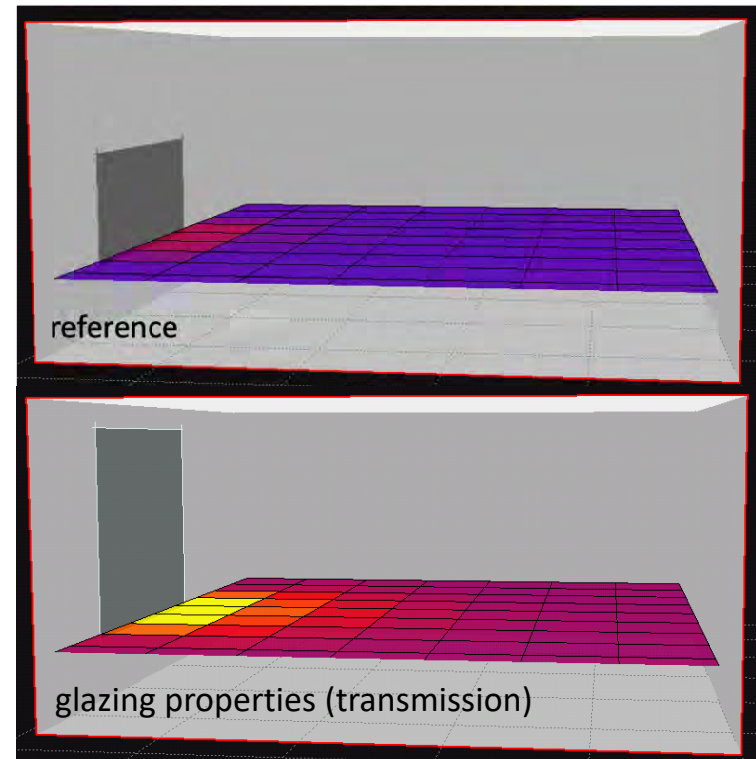
illuminance (lux)
February 27, 1:30pm
clear sky



Task illumination metrics

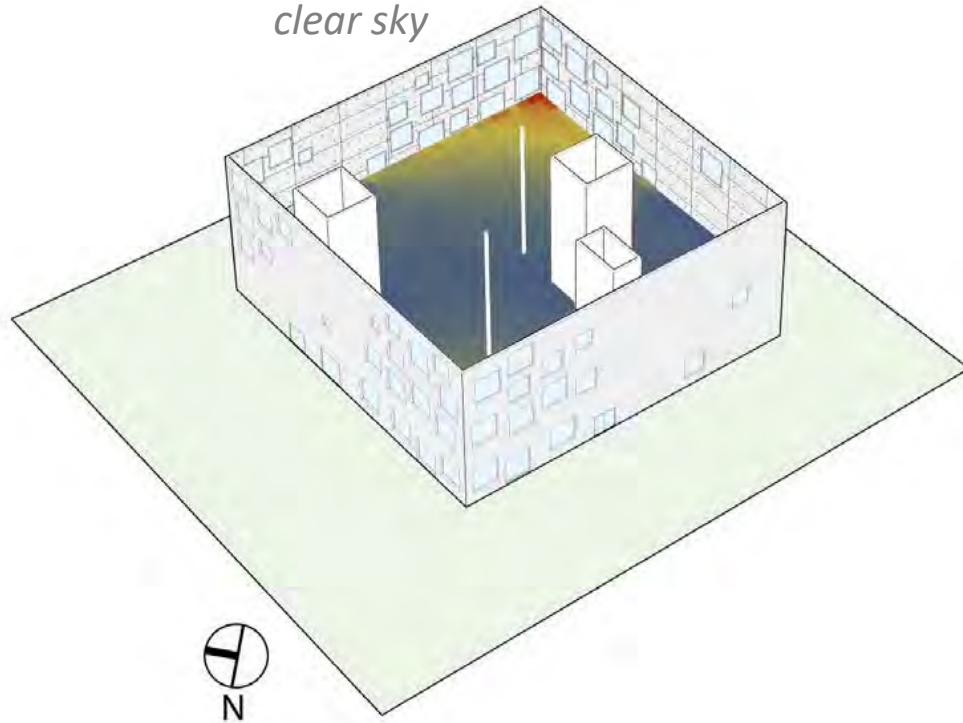
instantaneous

- illuminance (lux)



«measuring» daylight

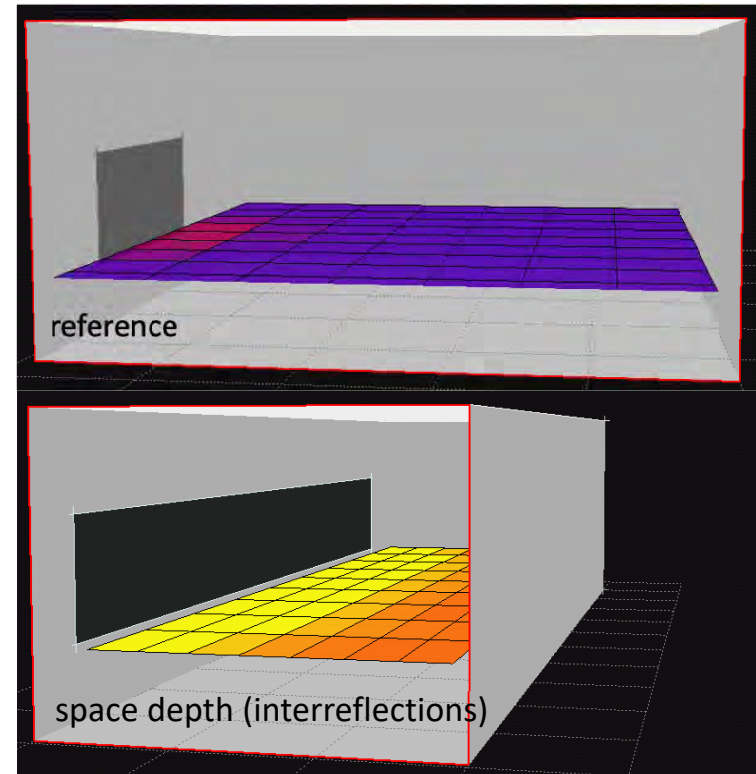
illuminance (lux)
February 27, 1:30pm
clear sky



Task illumination metrics

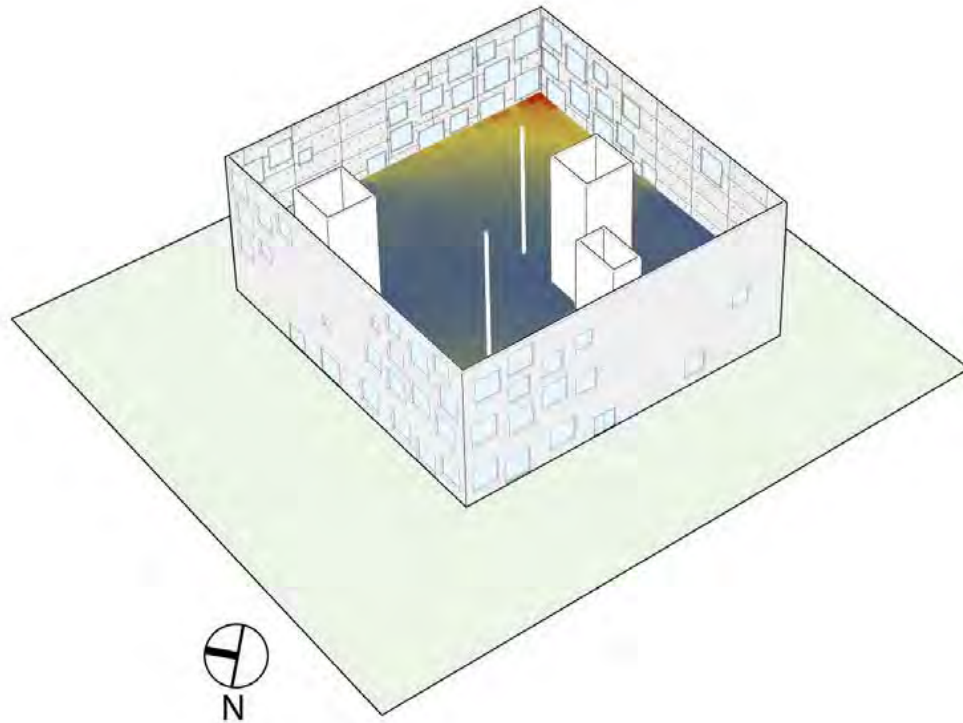
instantaneous

- *illuminance (lux)*



«measuring» daylight

annual performance
for given location

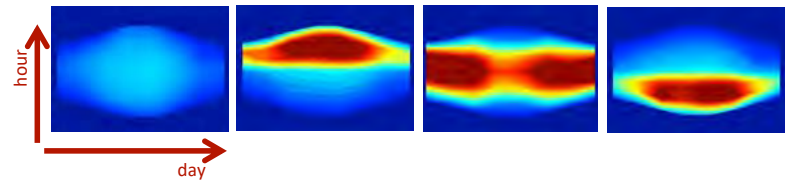
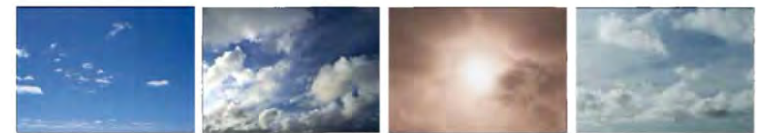


Task illumination metrics

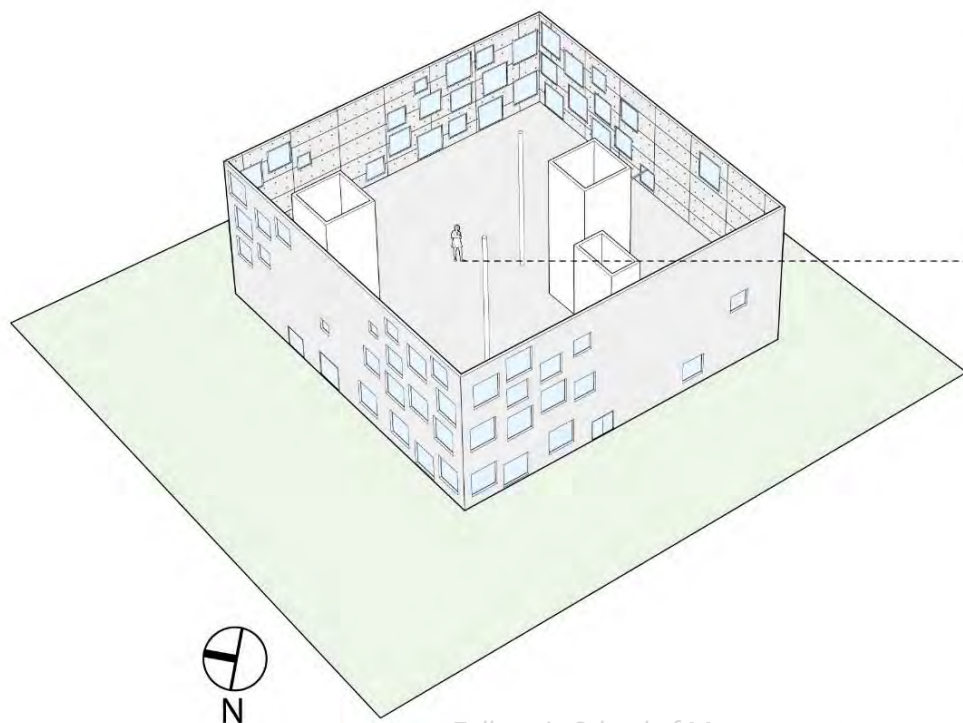
climate-based

- Useful Daylight Illuminance (UDI)
- Spatial Daylight Autonomy (sDA)
- Annual Sunlight Exposure (ASE)

IES LM-83



BUT... people perceive daylight from an immersed view

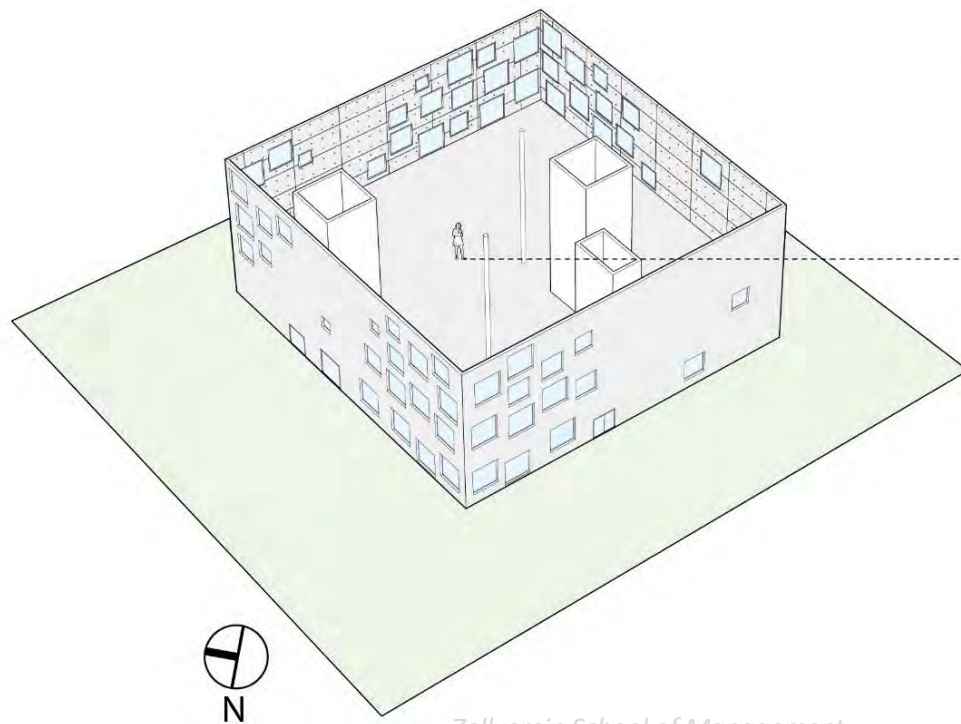


*Zollverein School of Management
Essen, Germany by SANAA*

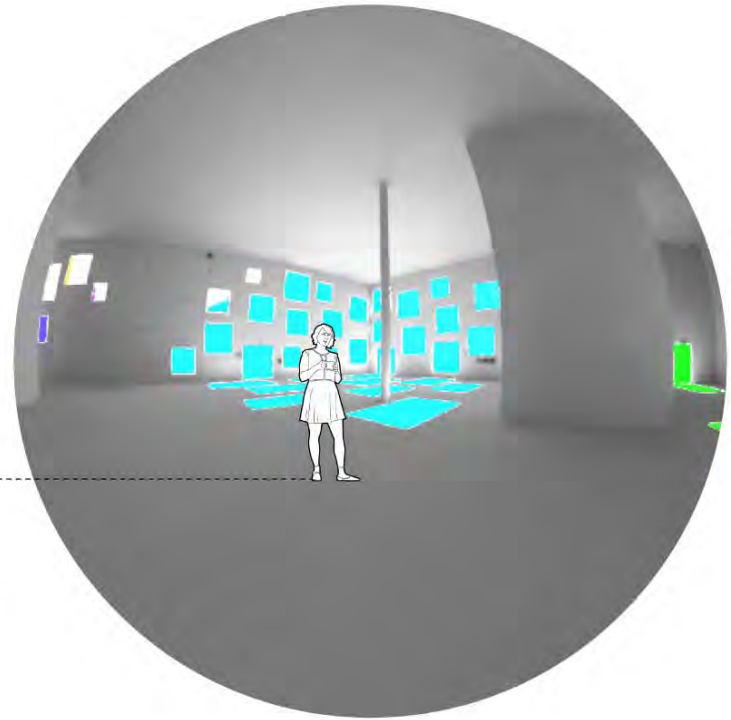


...and this view is constantly changing.

Today, there is only one (commonly used) way to evaluate that perception...



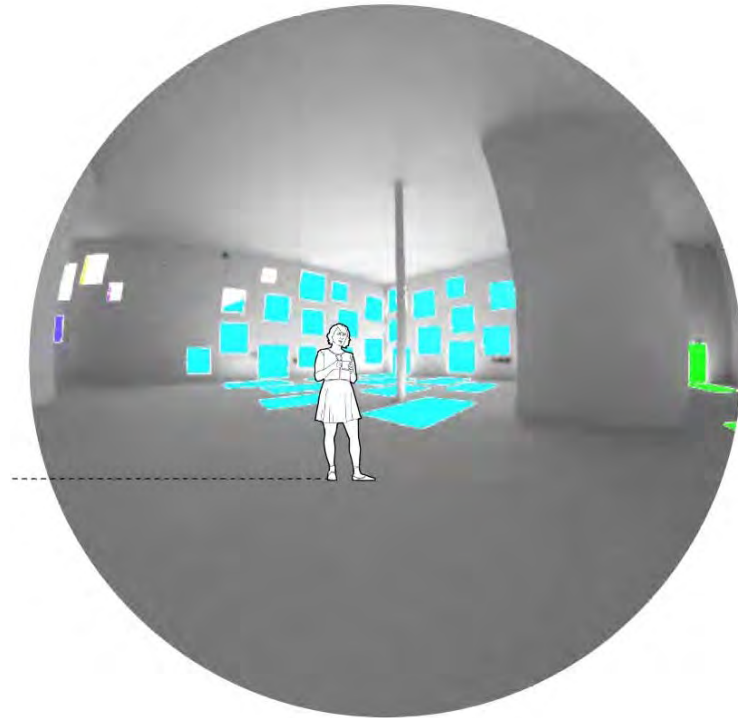
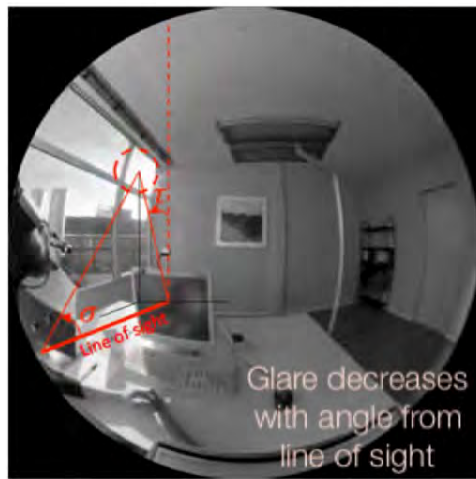
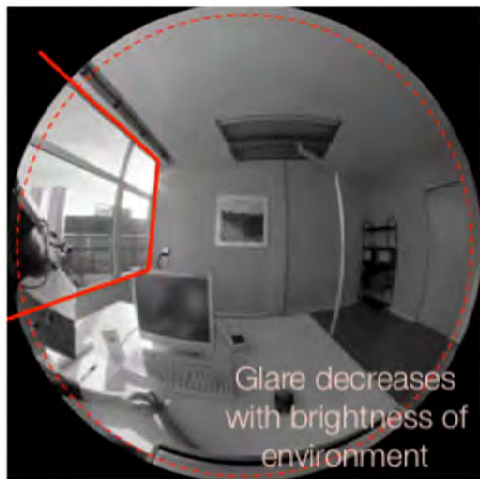
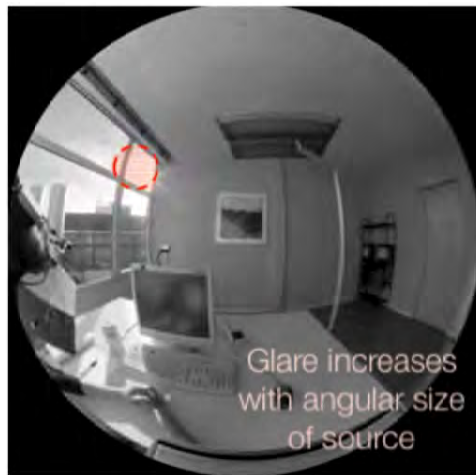
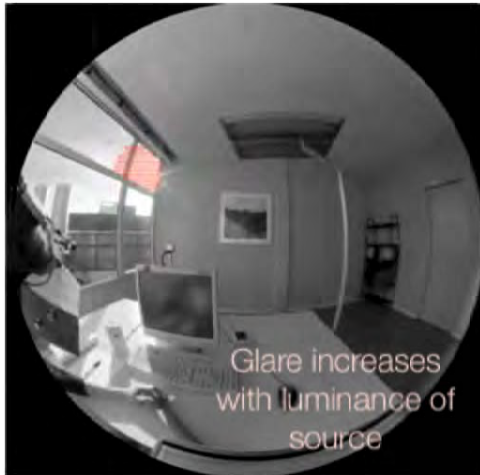
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...through **glare risk models**

- *Daylight Glare Probability (DGP)*
- *Daylight Glare Index (DGI)*

Today, there is only one (commonly used) way to evaluate that perception...



...through glare risk models

- Daylight Glare Probability (DGP)
- Daylight Glare Index (DGI)

$$G = \left(\frac{L_s^{exp} \omega_s^{exp}}{L_b^{exp} P_i^{exp}} \right)$$

Daylight is more than 'free' lighting with high glare risks:
we should appraise it beyond strict illumination and look for...



new metrics

human-centered
dynamic

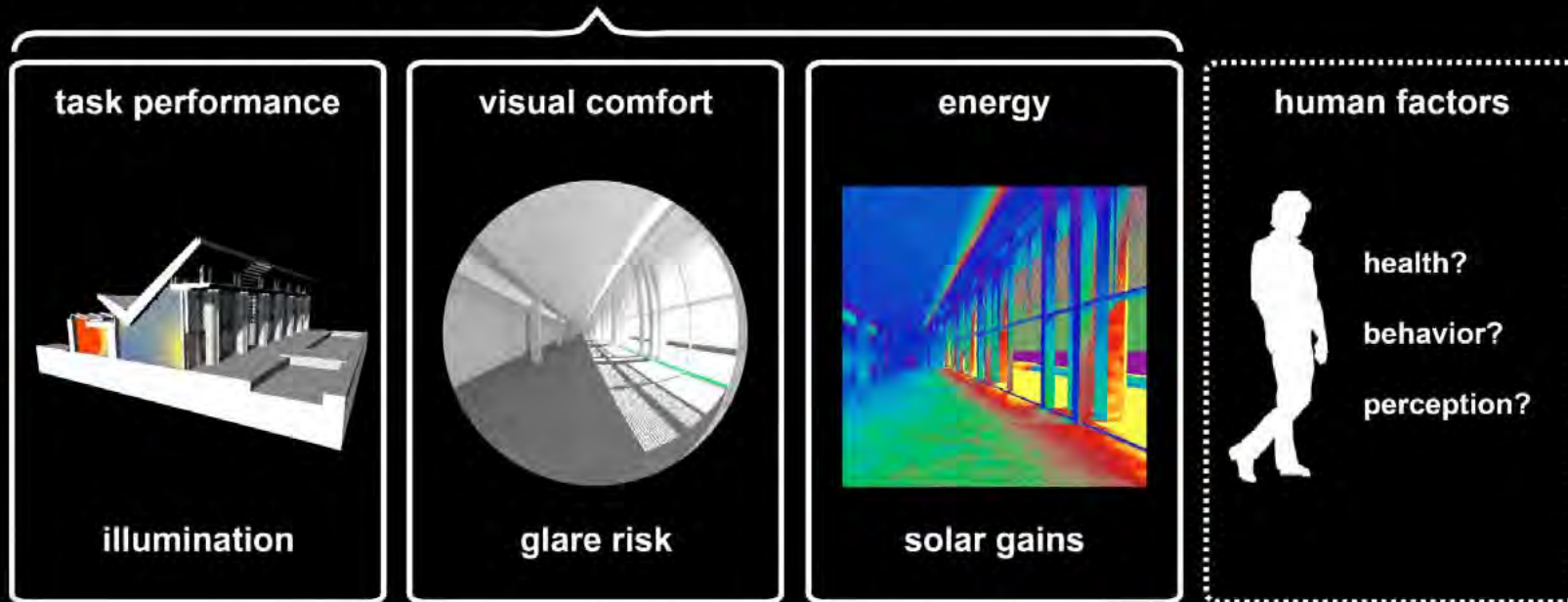
new visualizations

interactive
immersive

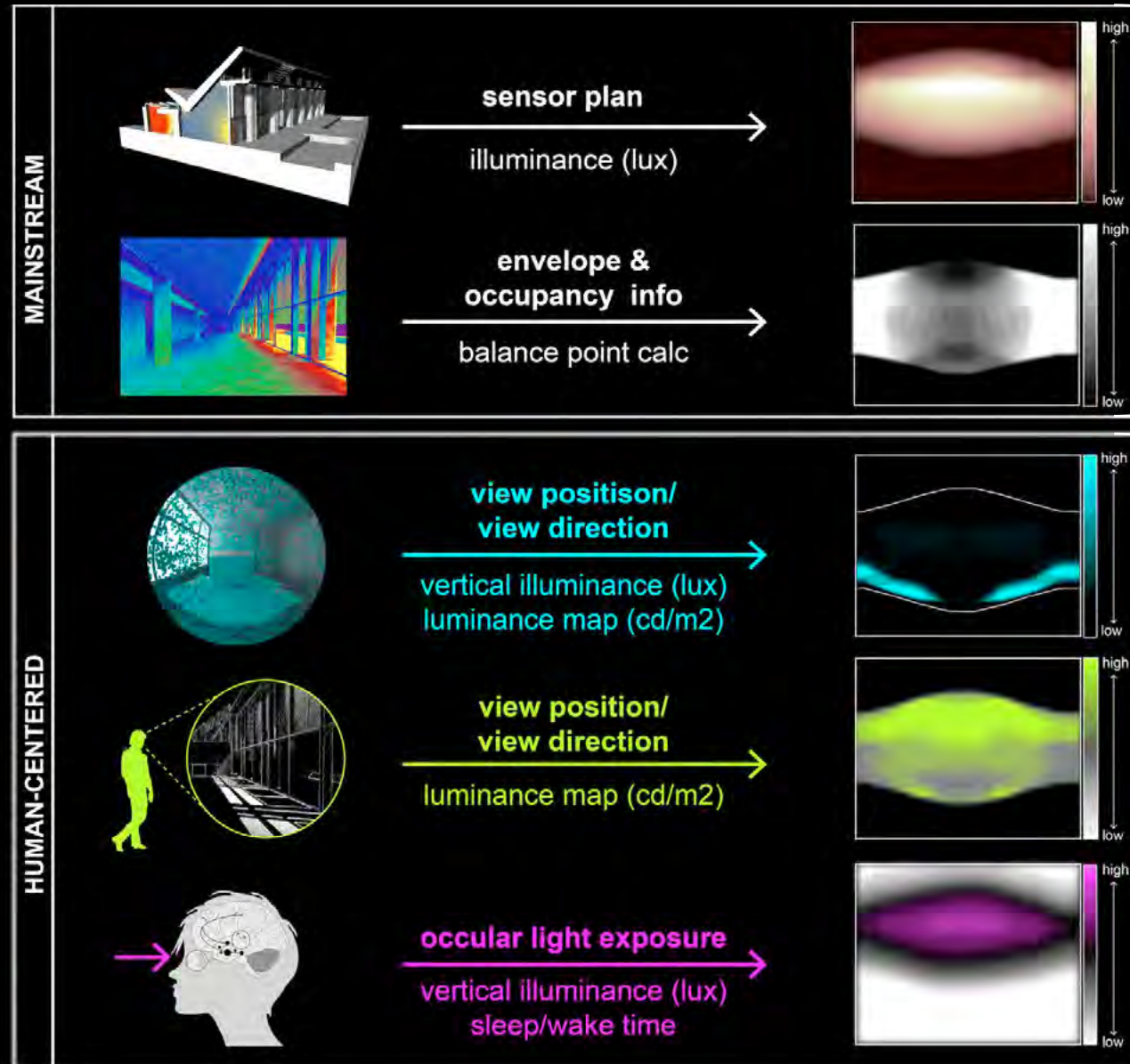
daylight dynamics and well-being

- human comfort and well-being back at the centre
- beyond mainstream metrics and performance evaluation

mainstream performance metrics



daylight dynamics and well-being

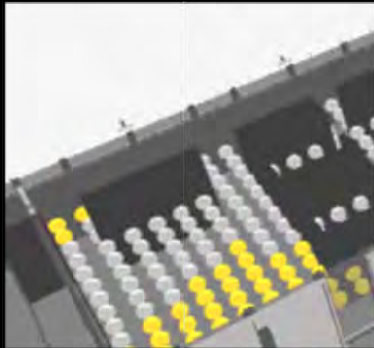


BEYOND ILLUMINATION

where and when healthy, stimulating, and comfortable light will to occur ...

GRID-BASED

adequate
task lighting



+

VITALITY
physiology



COMFORT
acceptability



EMOTION
psychology



... dynamically over time & space

visual comfort dynamics

glare and gaze



Prof. Mandana Sarey Khanie
LIPID PhD+PostDoc alumna – DTU

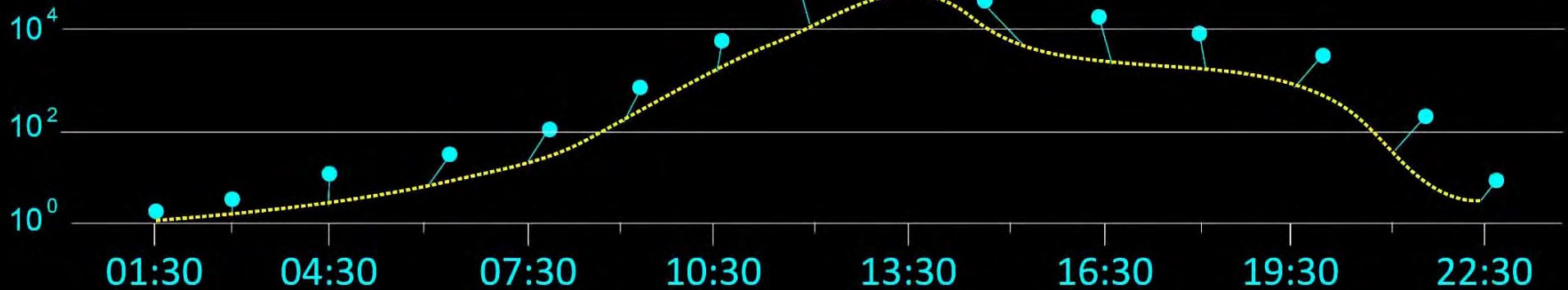


luminance map



glare input

gaze response



visual comfort dynamics

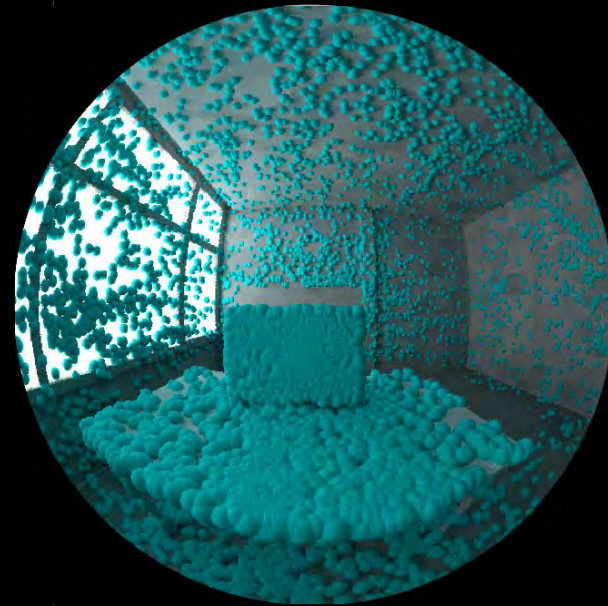
gaze behavior based on lighting conditions and task



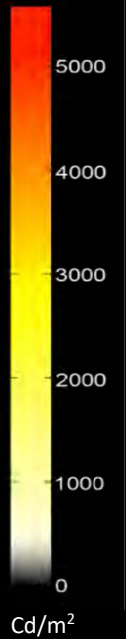
perceived light



field of view



talker's position



visual and thermal comfort

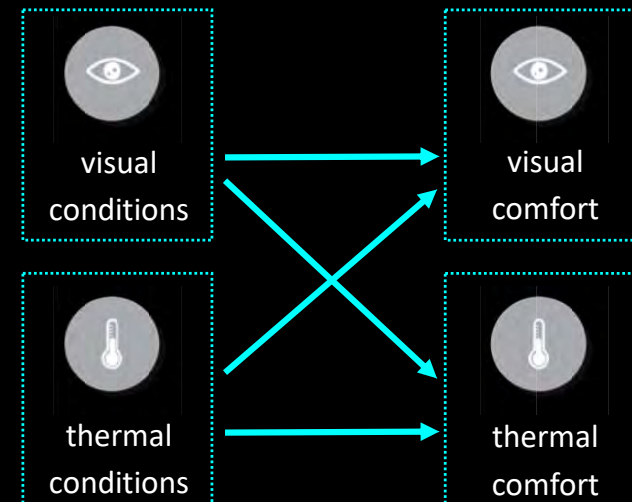
perceived interactions

Giorgia Chinazzo
PhD student



© FERNANDO GUERRA

SwissTech Convention Center / Richter Dahl Rocha & Associés



visual and thermal comfort

perceived interactions



- does thermal perception depend on **color of light**?

Your Rainbow Panorama by Studio Olafur Eliasson



visual and thermal comfort

perceived interactions



© THOMAS MAYER

Rolex Learning Center / SANAA

- does thermal perception depend on **color of light**?
- does thermal perception depend on **brightness**?
- does visual perception depend on **temperature**?



visual and thermal comfort

interaction effects



color of light & temperature



light quantity & temperature

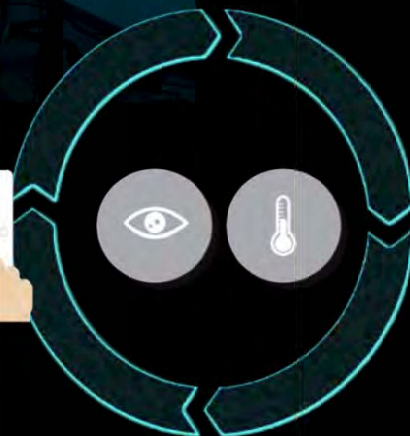


visual and thermal comfort

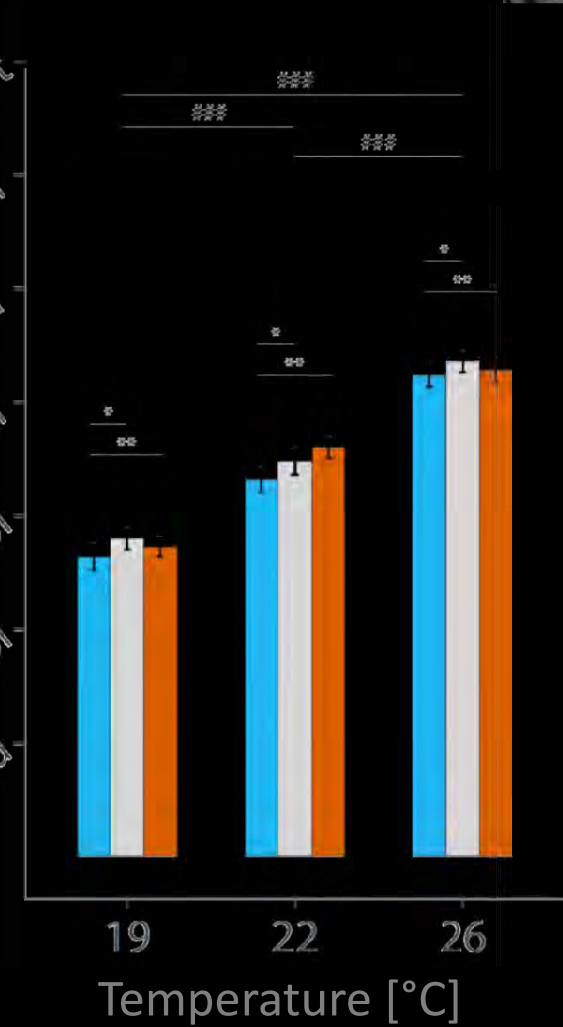
interaction effects



color of light & temperature

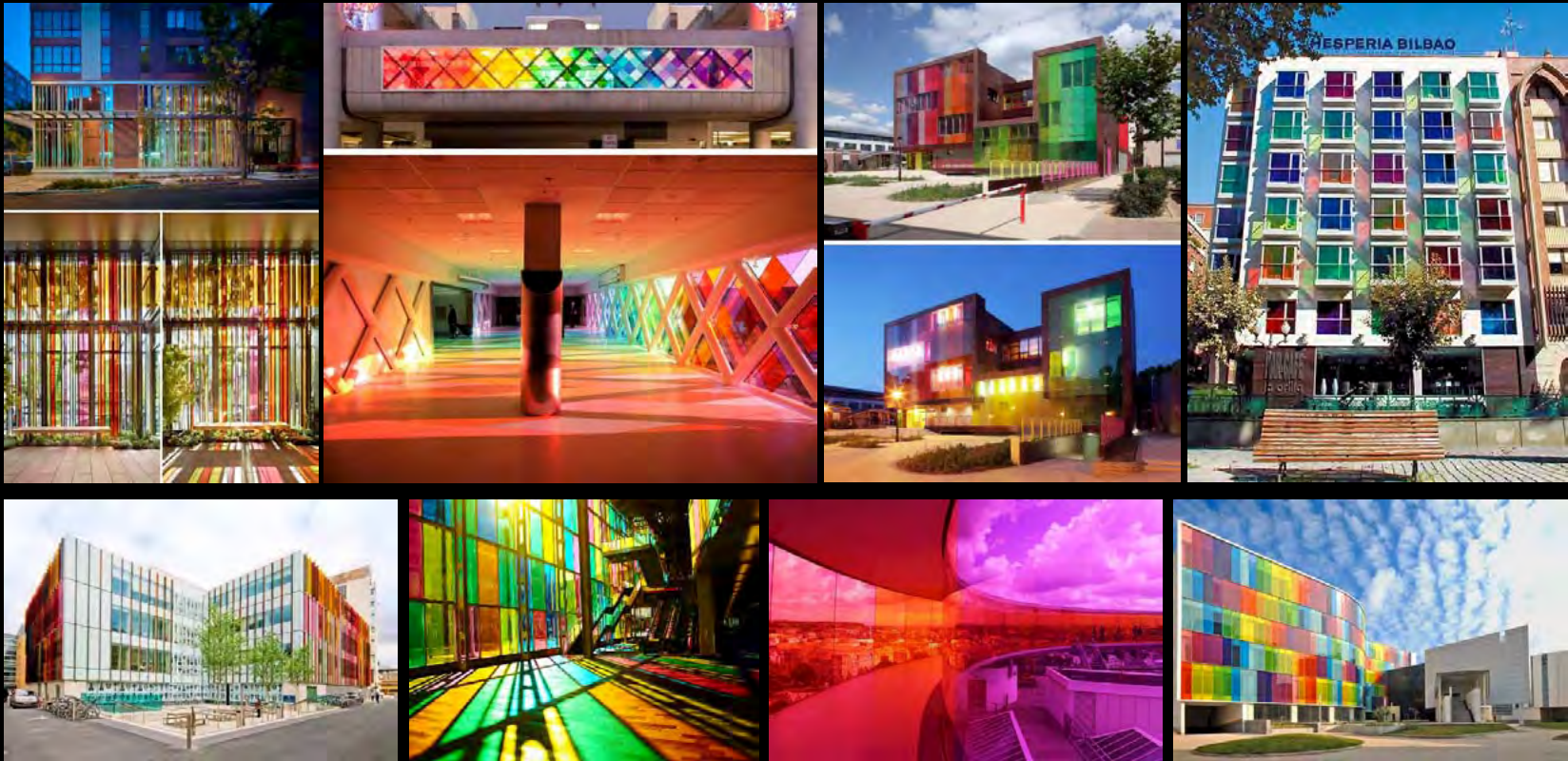


Hot
Warm
Slightly warm
Neutral
Slightly cool
Cool
Cold



visual and thermal comfort

impact on thermal perception of a visual experience



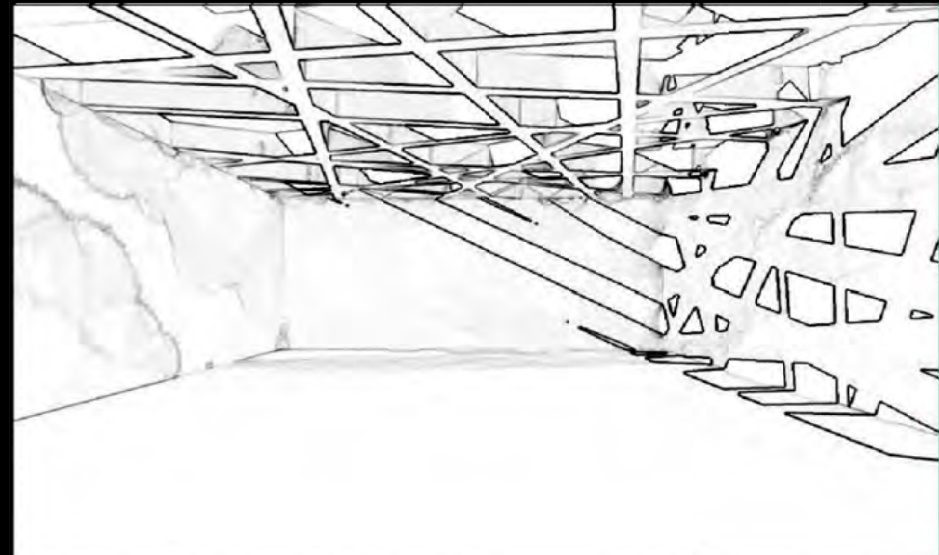
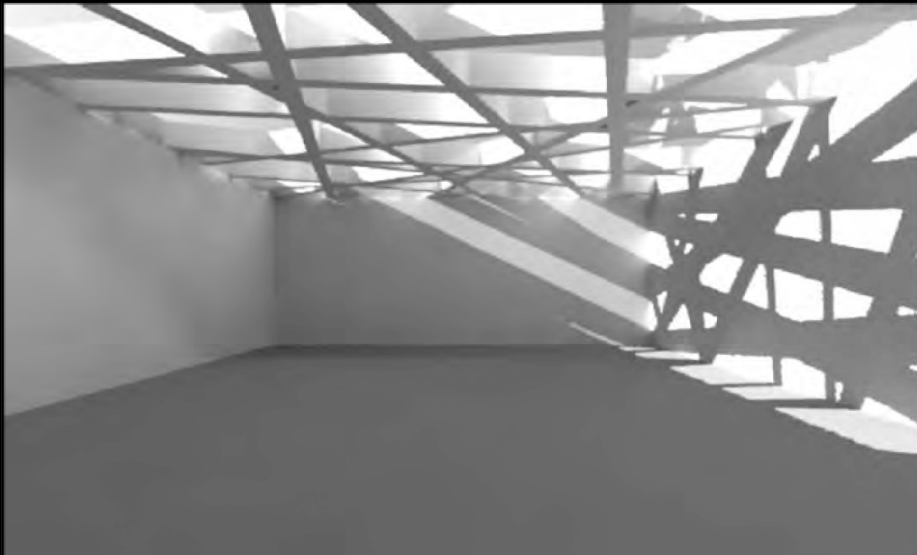
emotion

perceptual effects and visual interest in daylight architecture

Prpf. Siobhan Rockcastle

LIPID PhD+PostDoc alumnus

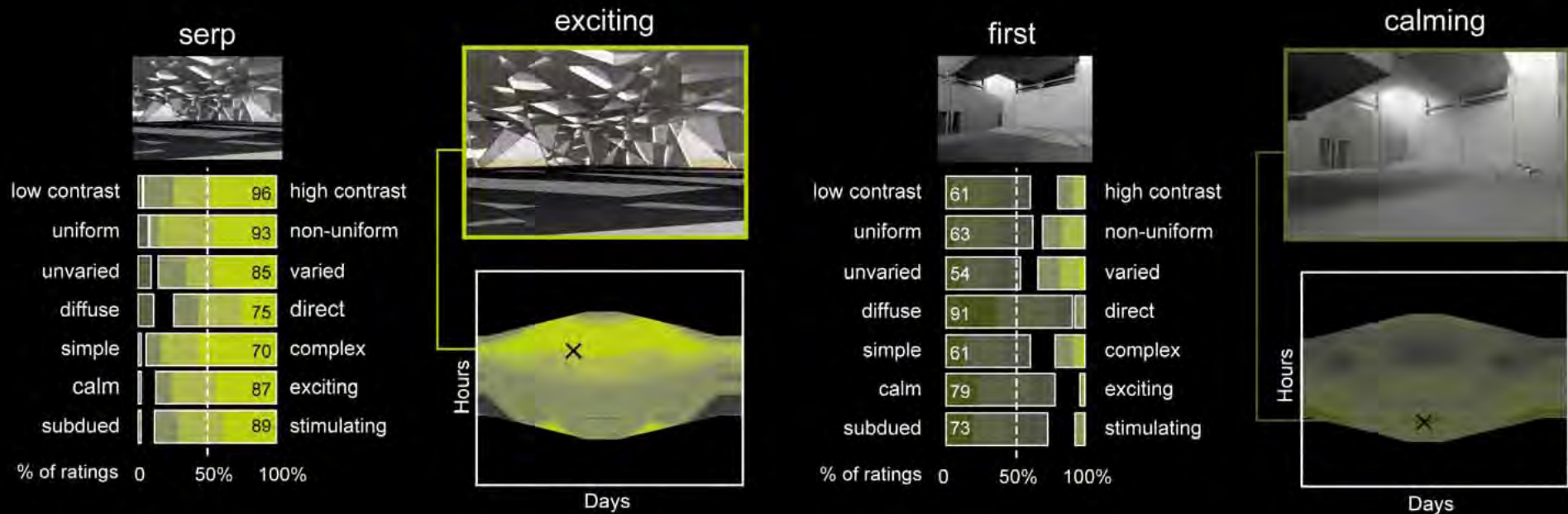
Co-Founder of OCULIGHT – U of O, USA





spatial contrast

subjective rating of rendered architectural spaces (online survey)



+ effect of sky (weather)



spatial contrast

dynamic spatial and temporal qualities of daylight



exciting



exciting



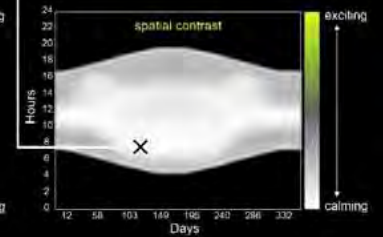
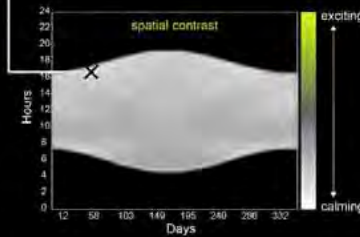
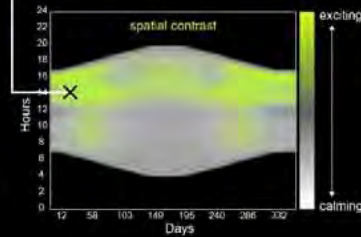
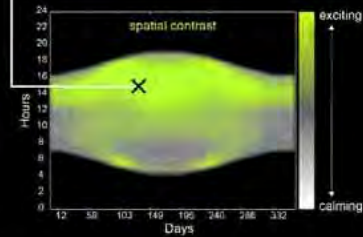
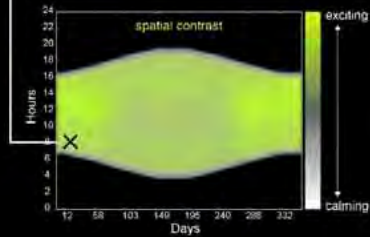
exciting



calming



calming



perception of daylight patterns

irregularity linked to positive impressions



Kynthia Chamilothoni
PhD student



Demonstration of the experimental setup by G. Chinazzo



Dr. Jan Wienold
Co-advisor

perception of daylight patterns

*irregularity linked to positive impressions
and measurable calming effect*



2



1



3

Giorgia Chinazzo
PostDoc researcher

