Physique du Bâtiment II
Phénoménologie

Chapitre 4.4	Rayonnement
Chapitre 9	Photométrie
(Ch 1)	Propagation de la lumière
Chapitre 10	Colorimétrie
(Ch 2)	Perception des couleurs
	Diagramme chromatique
Chapitre 6	Propriétés des ondes sonores
	Superposition des ondes
	Propagation du son
	Acoustique géométrique
	ondulatoire
	statistique

EPFL

Centrale PV « ESOPP » @ EPFL

selon projet: 20’000 m^2, 2 MW peak

Partenaire: Romande Energie

Façade Integration of PV

ELL Building on EPFL Campus

Full PV façade with novel solar glazing

Development: LESO-PB, EPFL
Industrial Partners: Emirates Insolaire/SwissINSO & ACOMET

Roof Integration of PV

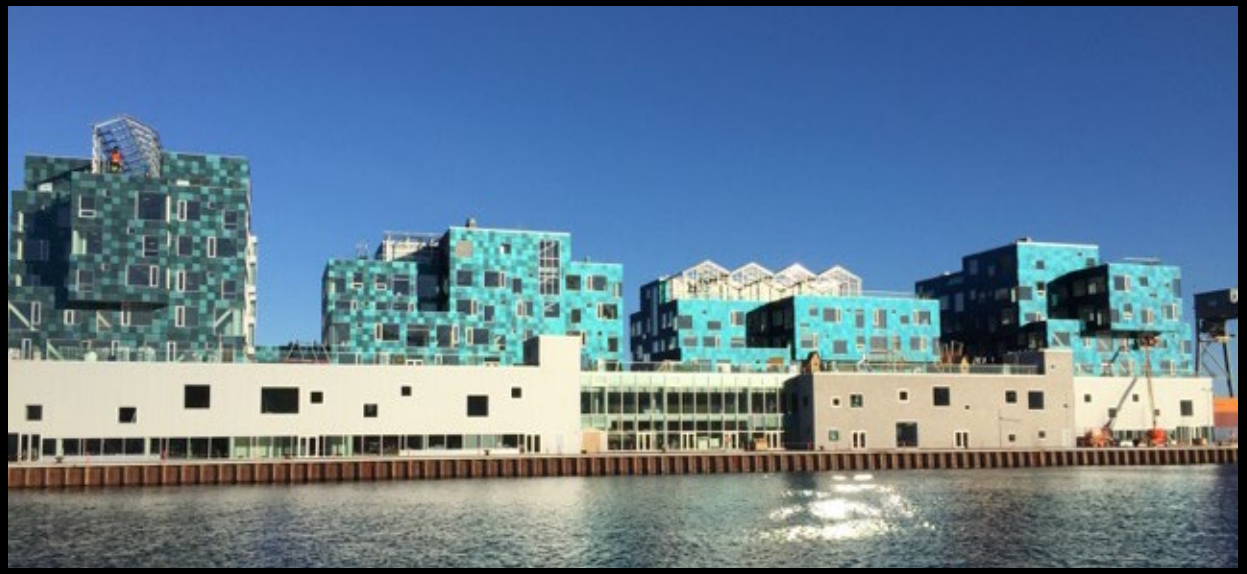
Project Chigny, Switzerland, architect Dieter Dietz

- Complete solar roof
- Kromatix frameless PV modules (glass/glass).
- 250x1'000mm (standards).
- 193 m^2 of standard size panels
- 33,5 m^2 of custom-made sizes.

- Total **227 m2**
- **20,5 kWp** Installed
- **11,7 MWh/year**

Copenhagen International School:
the world's largest solar facade

Photography: Pilippe Vollichard



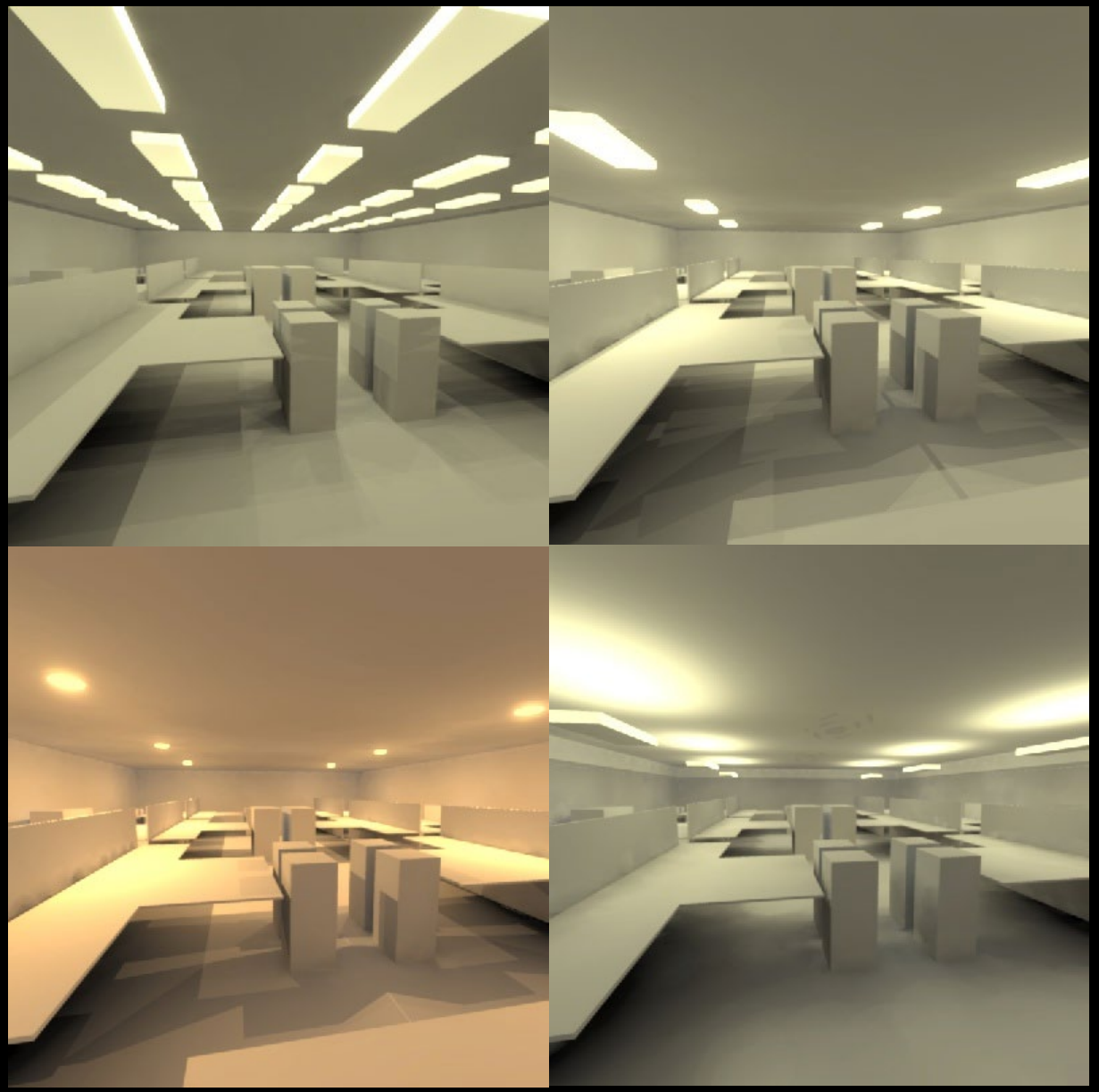
6'600 m^2, 13'000 modules,
Electrical peak power 720 kWp

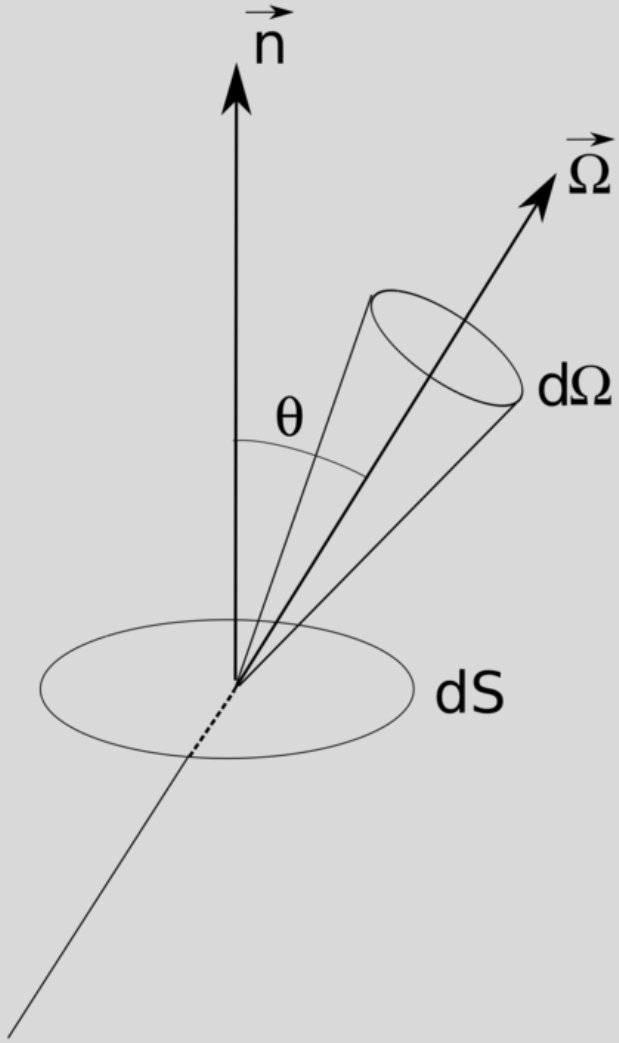
„5-Solar powered buildings
that will forever change architecture"

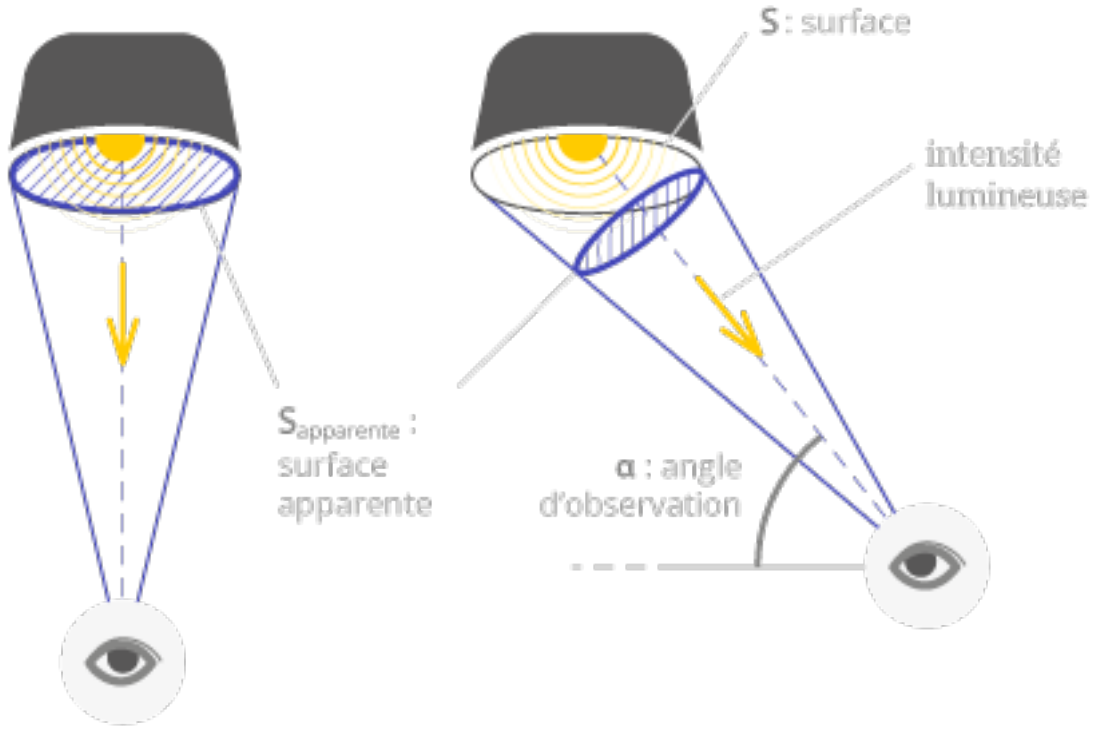
M. D'Estries, Mother Nature Network,
www.mnn.com, September 14, 2016

Development: LESO-PB, EPFL
Industrial partners: SwissINSO, Emirates Insolaire, SolarLab, C.F Møller Architects

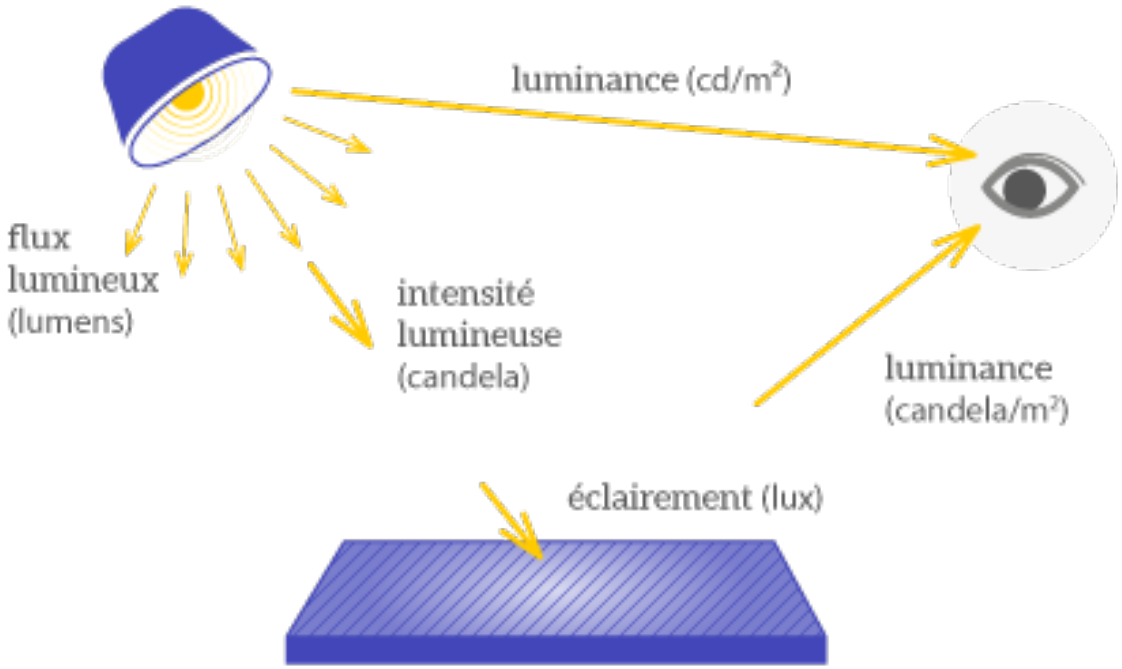
Lighting design of office spaces

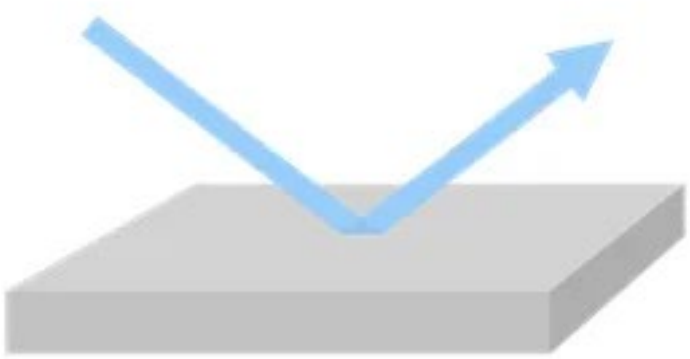



$\vec{n}$
$\vec{\Omega}$
$d\Omega$
θ
dS

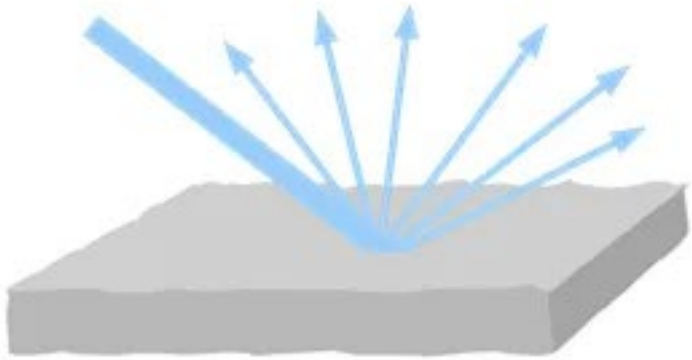


luminaire vu de côté :
la surface apparente diminue, et généralement le flux dans cette direction aussi.

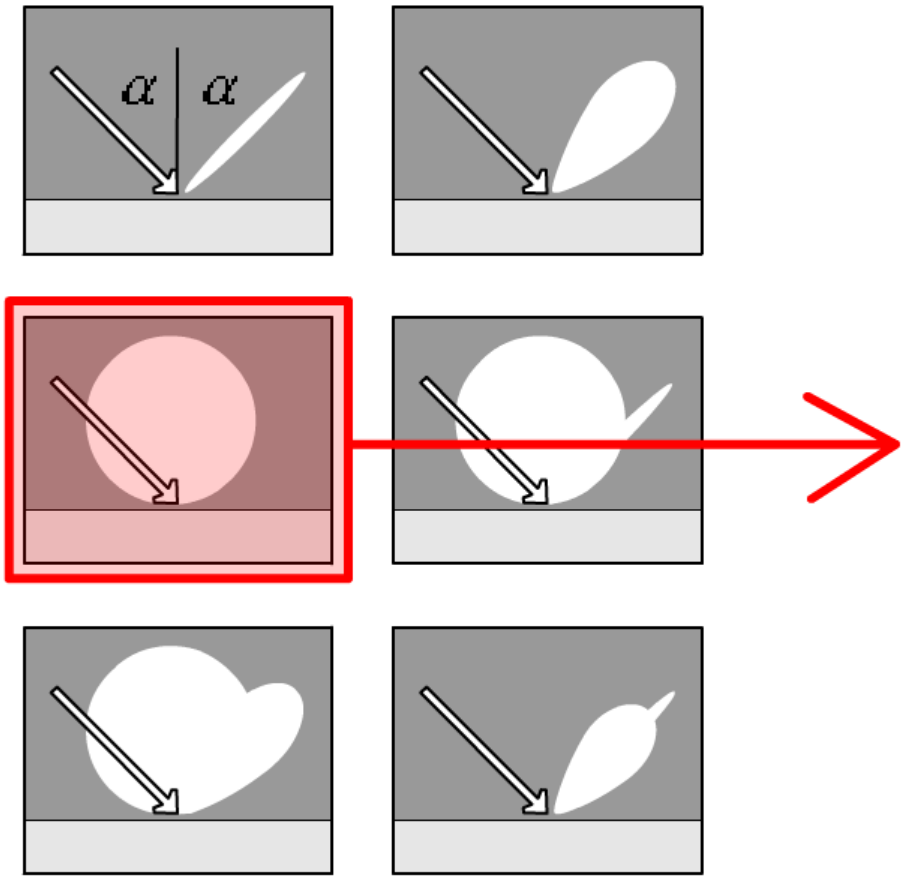

luminance (cd/m²)
flux
lumineux
(lumens)
intensité
lumineuse
(candela)
luminance
(candela/m²)
éclairement (lux)

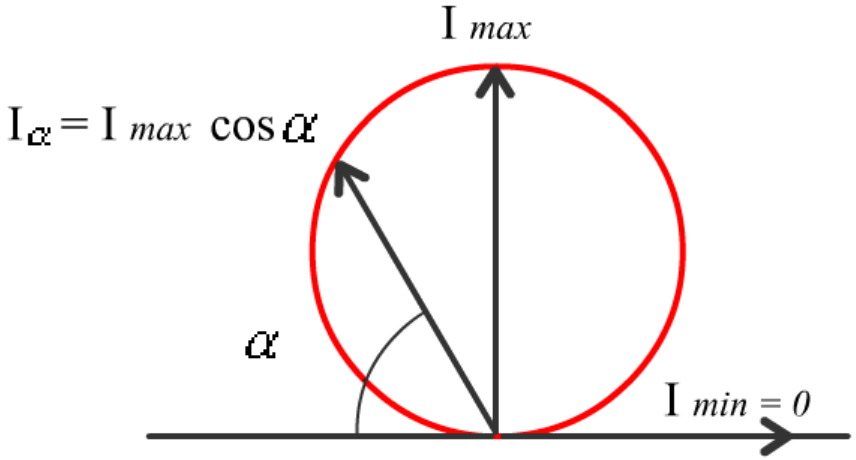


spéculaire

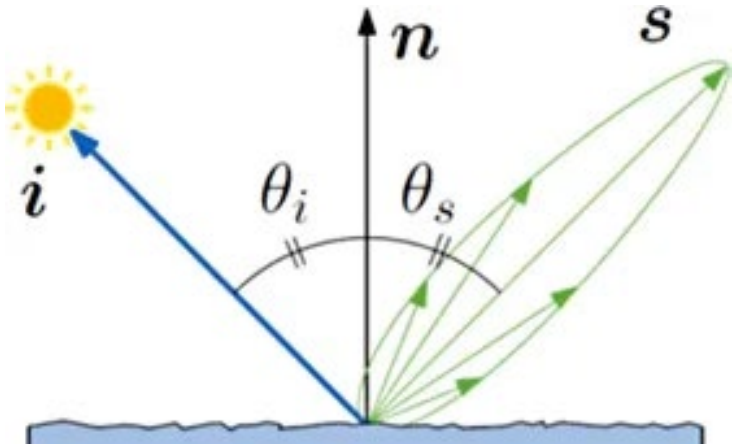


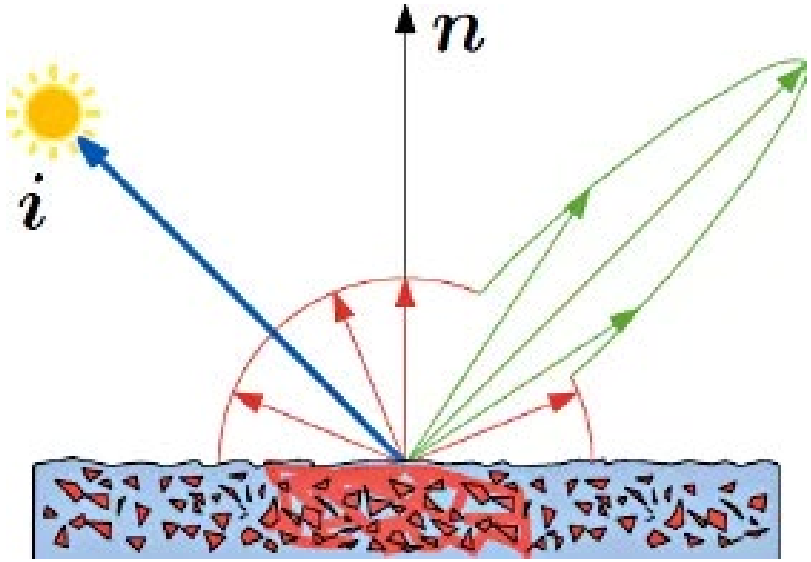
diffuse

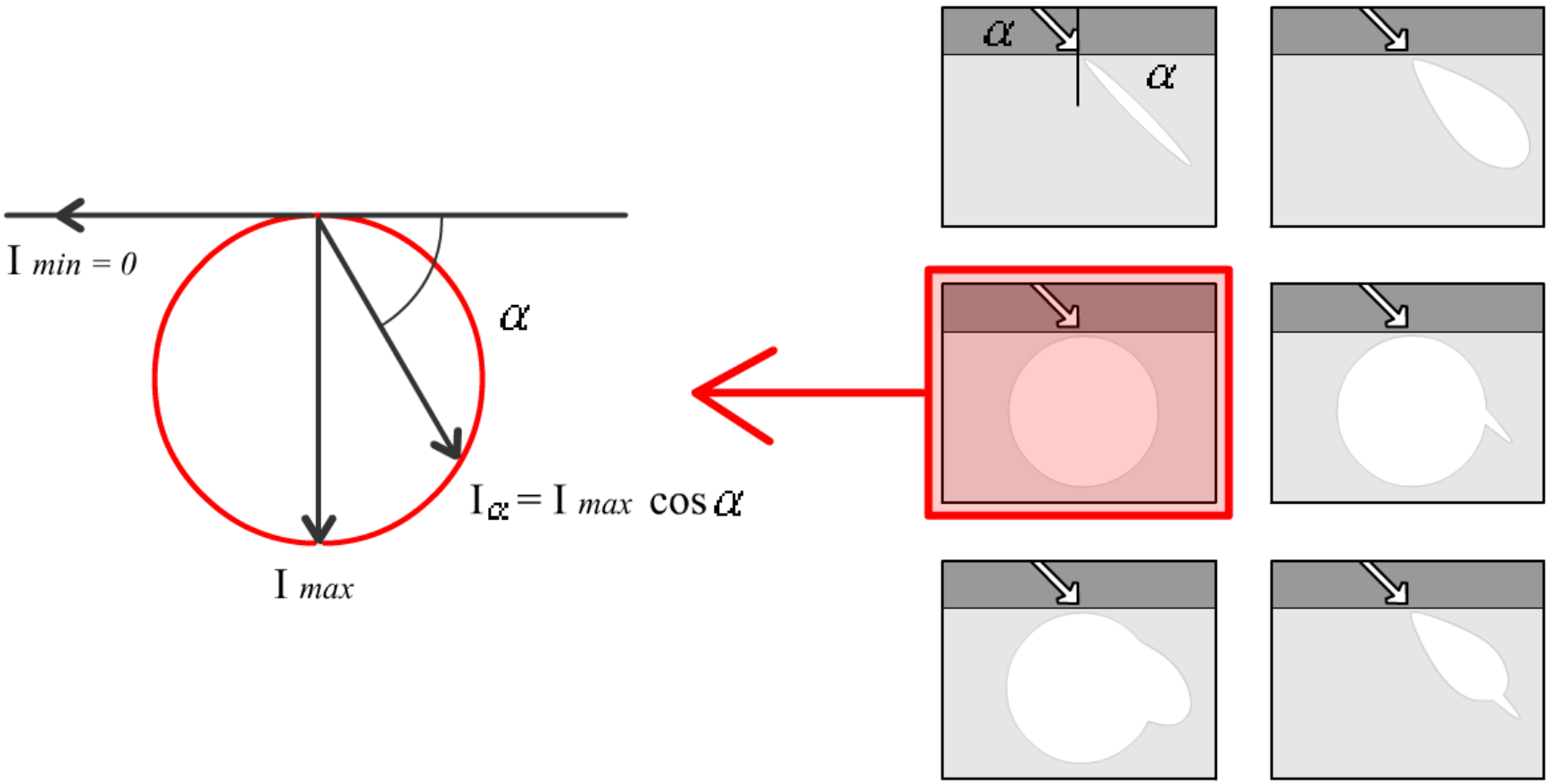


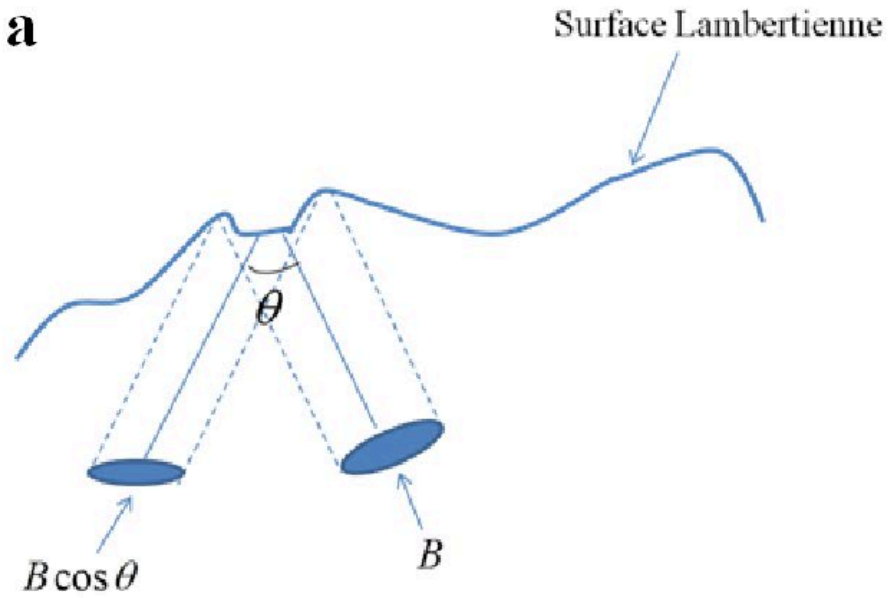


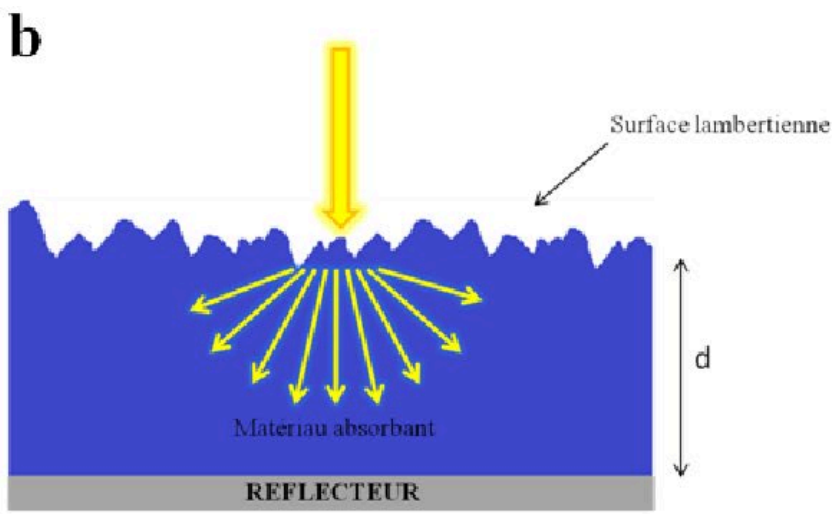
L' Indicatrice de diffusion permet, pour un materiau diffusant, de caracteriser la repartition spatiale de l'intensité des rayons emergents


n
s
i
θ_i
θ_s


n
i


I min = 0
α
I α = I max cos α
I max
α
α


a
Surface Lambertienne
θ
B cos θ
B

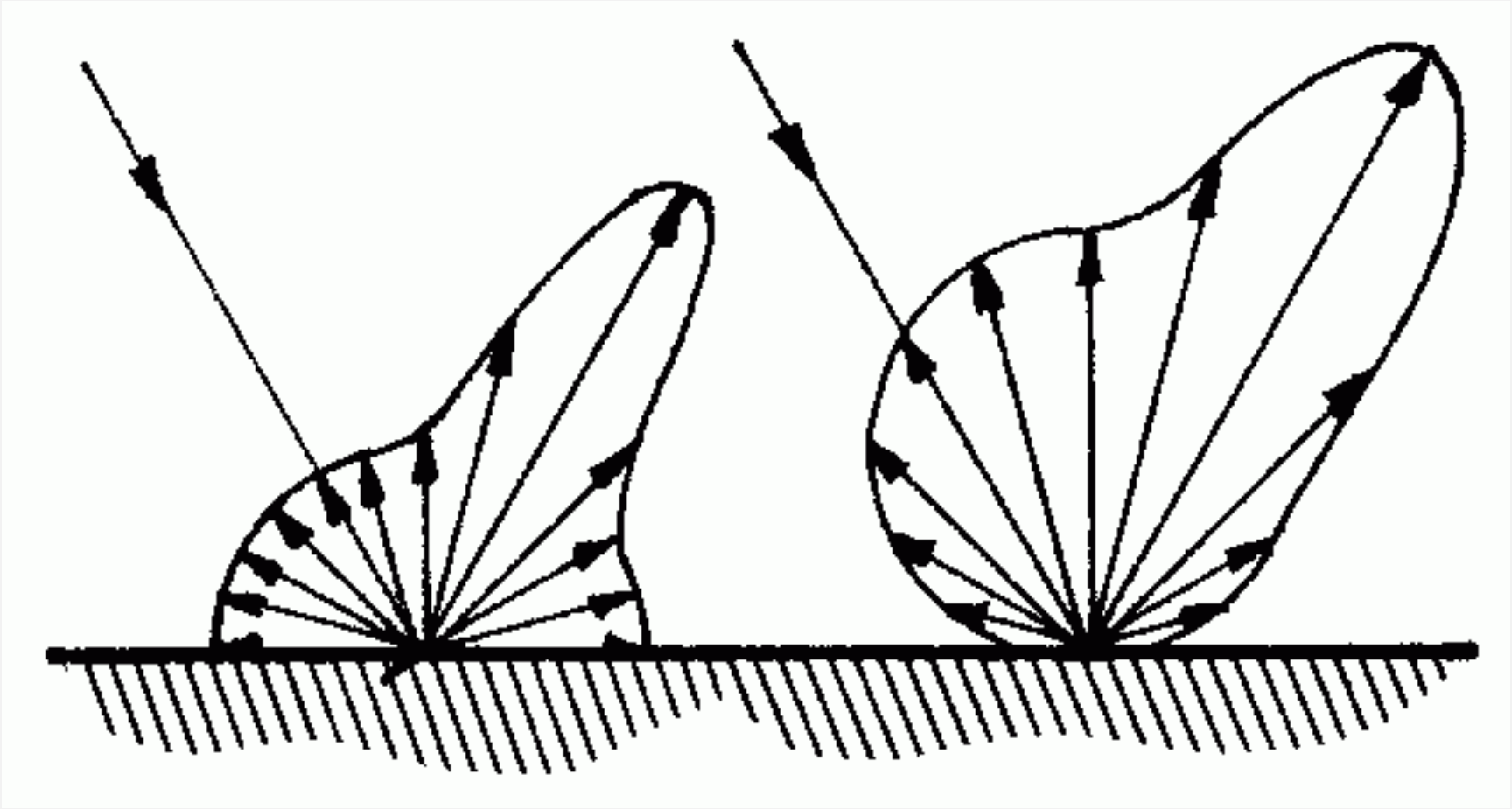

b
Surface lambertienne
d
Materiau absorbant
REFLECTEUR

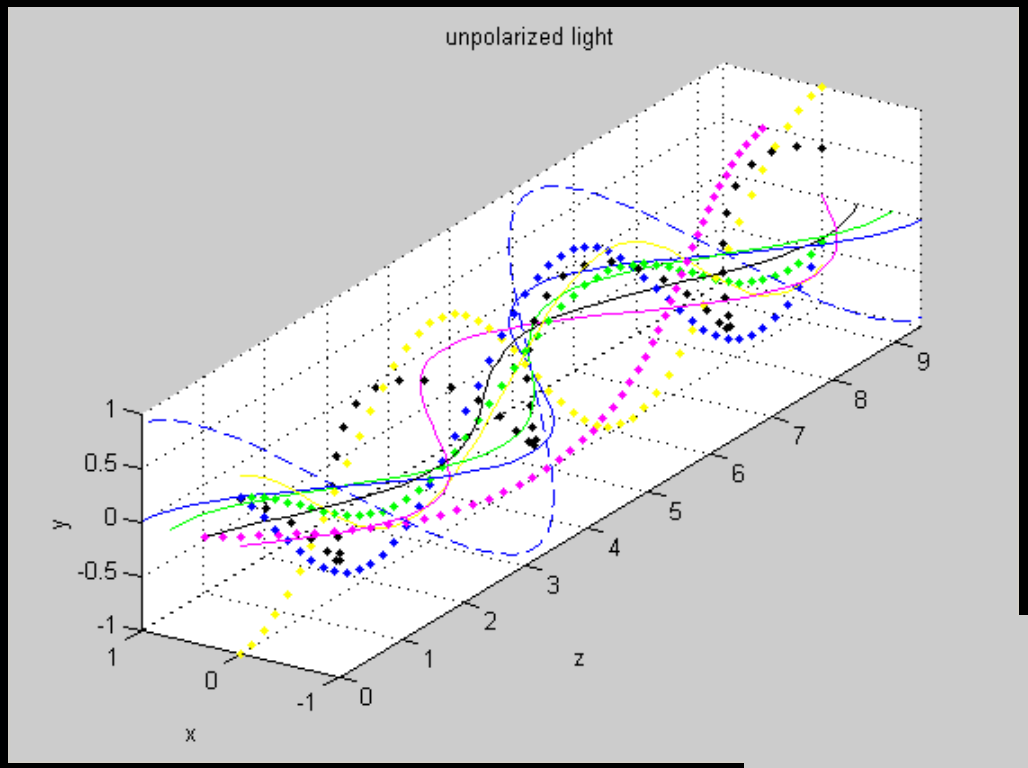
Atelier Dirk Bürklin (D)

Atelier Bea Frey, Bâle

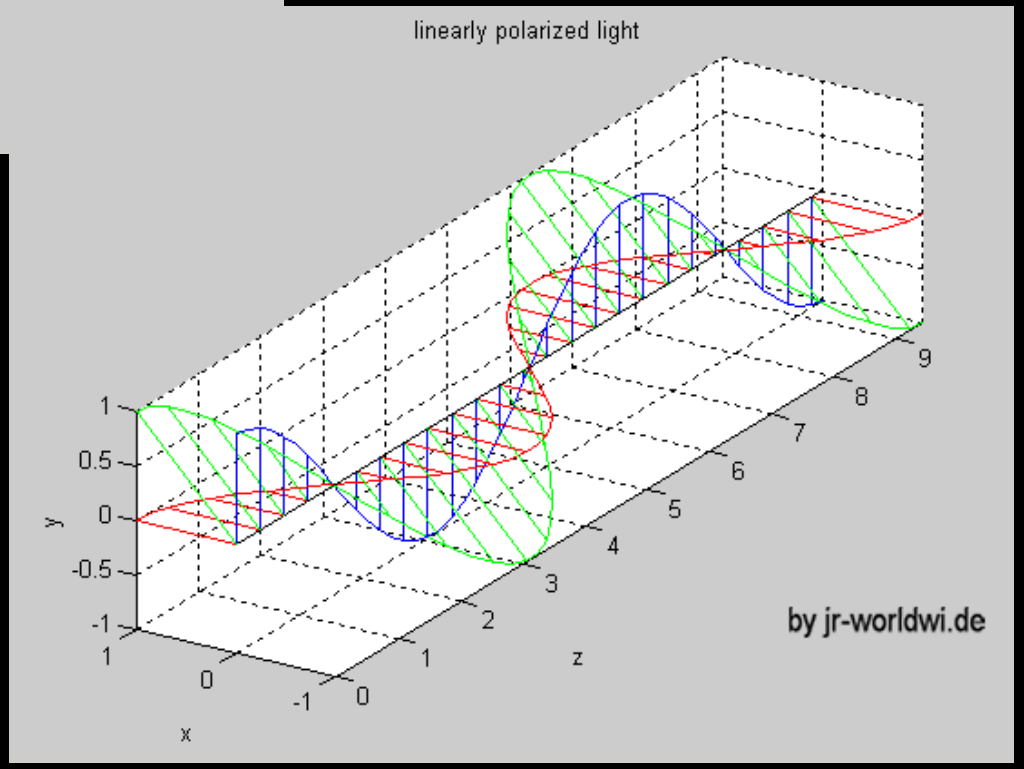
Vitraux par Marc Chagall

EPFL
Bâtiment BI





Lumière non polarisée



Lumière polarisée

La même photo prise

sans

avec

filtre polarisant

Kyoto station

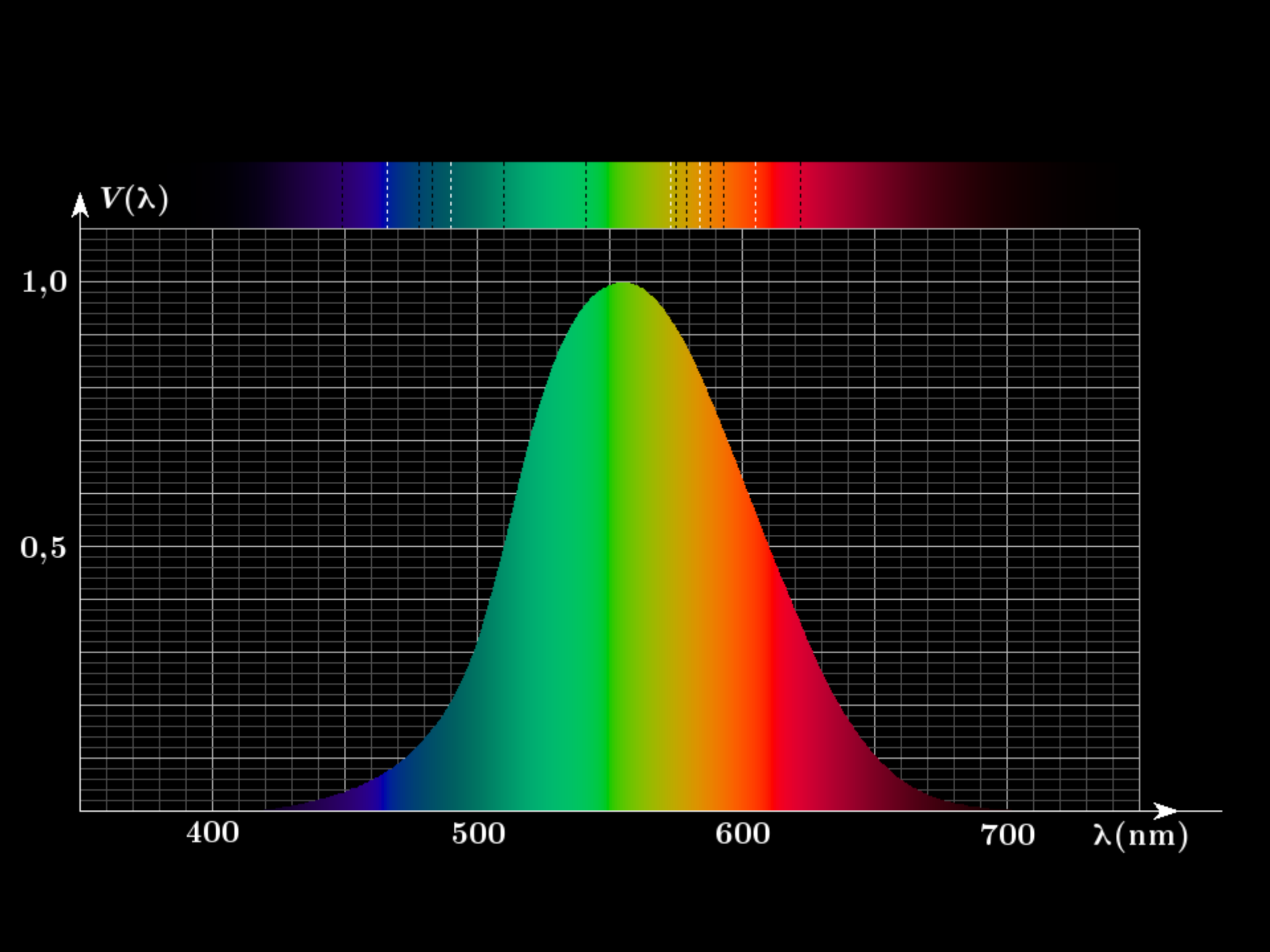
Forum building, Norwich

Hearst Tower, New York

Swiss Re Tower, London

Norman Foster and Partners

German Parliament, Berlin


V(λ)
1,0
0,5
400
500
600
700
λ(nm)