

# Visual comfort

- ▶ Key aspects of daylight environment
  - Visual performance
  - Physiological conditions
  - Visual quality

# Visual comfort

## ▶ Key aspects of daylit environment

## ▶ Objectives

- Harmonious luminance distribution (no strong contrasts)
- Good color rendering (continuous spectrum, appropriate color  $T^\circ$ )
- Adequate illuminance level
- No disturbing reflections
- No direct glare

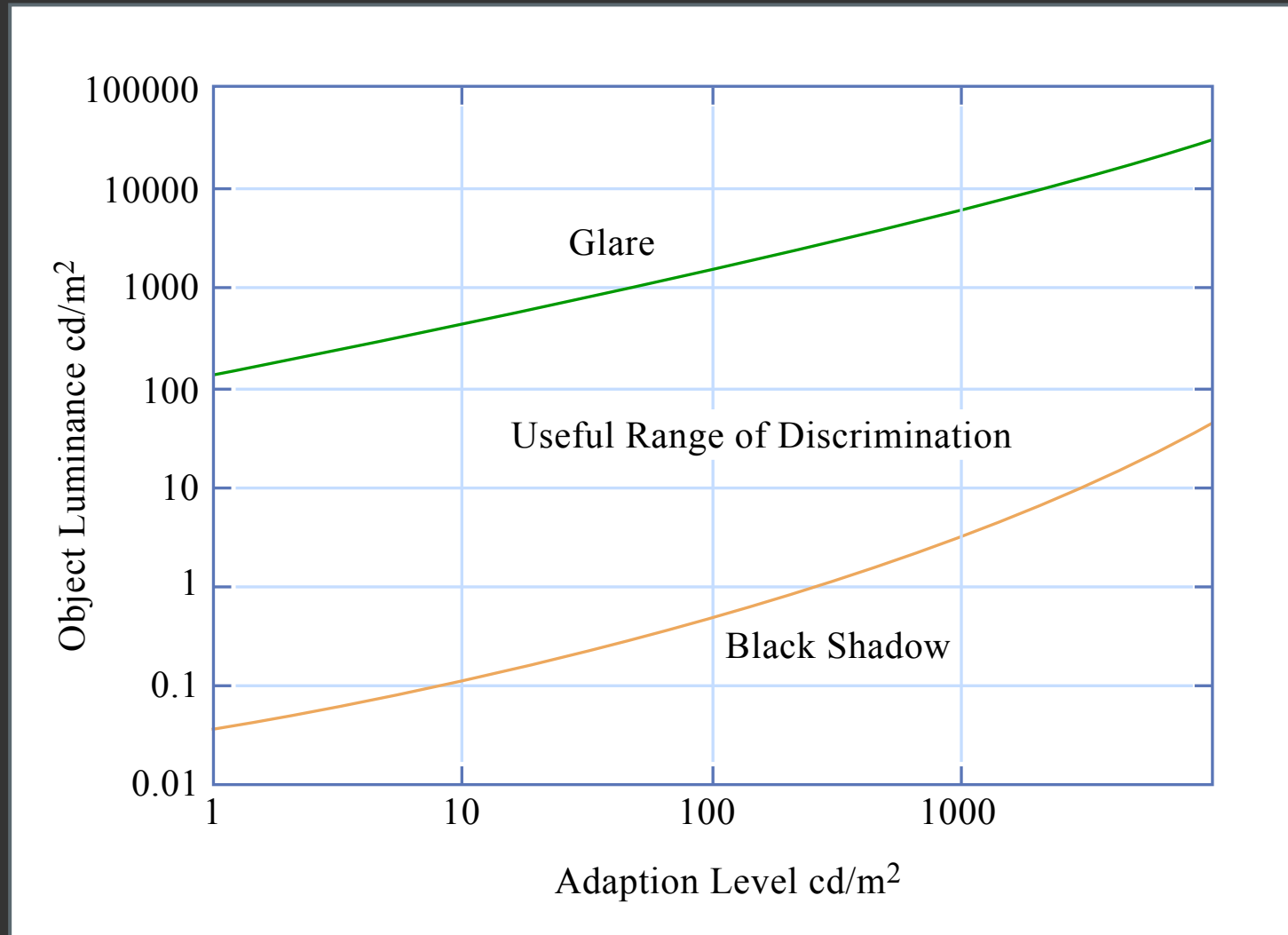
# Visual comfort

- ▶ Key aspects of daylight environment
- ▶ Objectives
- ▶ Recommended illuminances

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

# Visual comfort

## ► Visual adaptation



# Visual comfort

- ▶ Visual adaptation
- ▶ Visual field

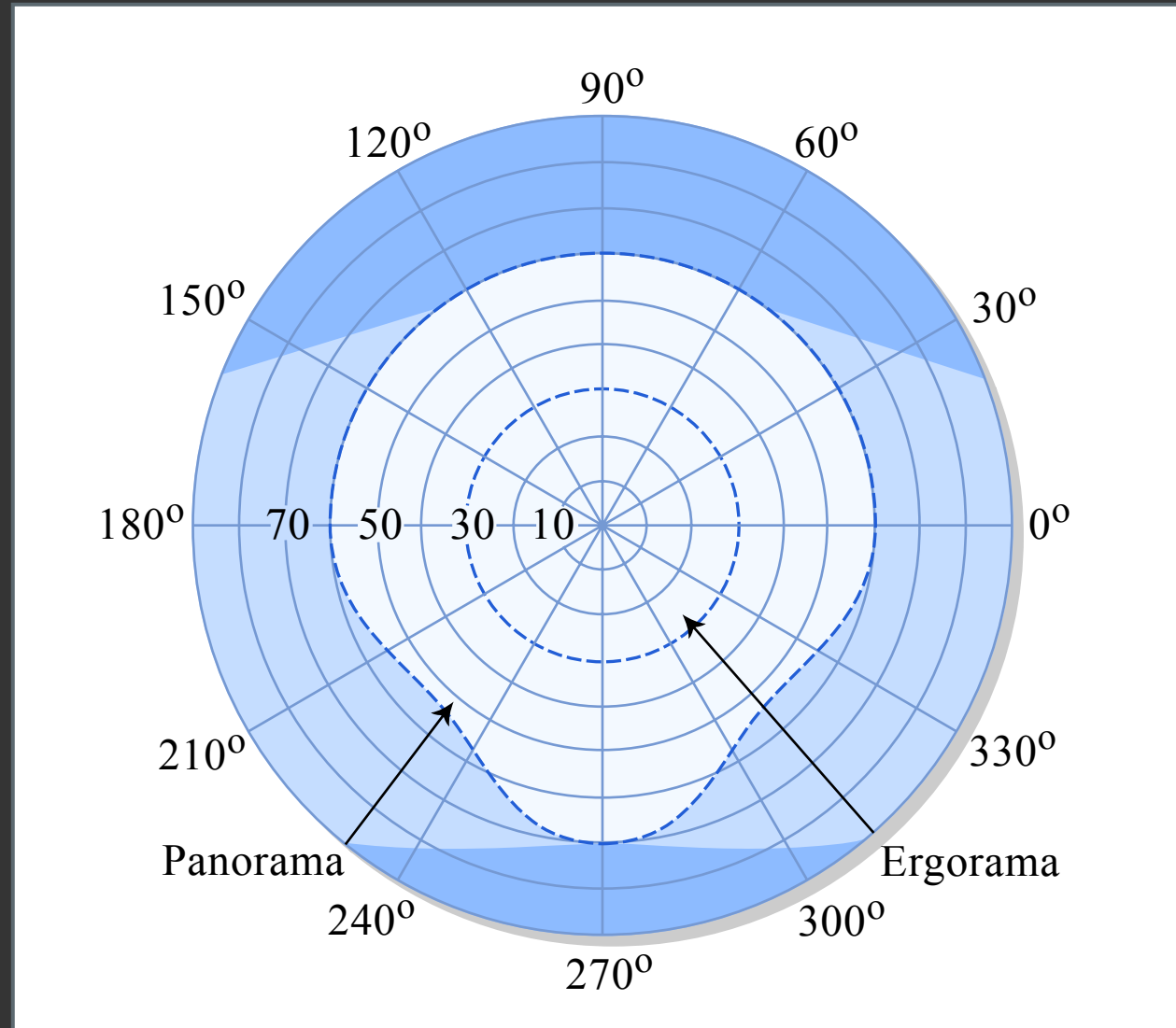


Figure by MIT OCW.

# Visual comfort

- ▶ Visual adaptation
- ▶ Visual field

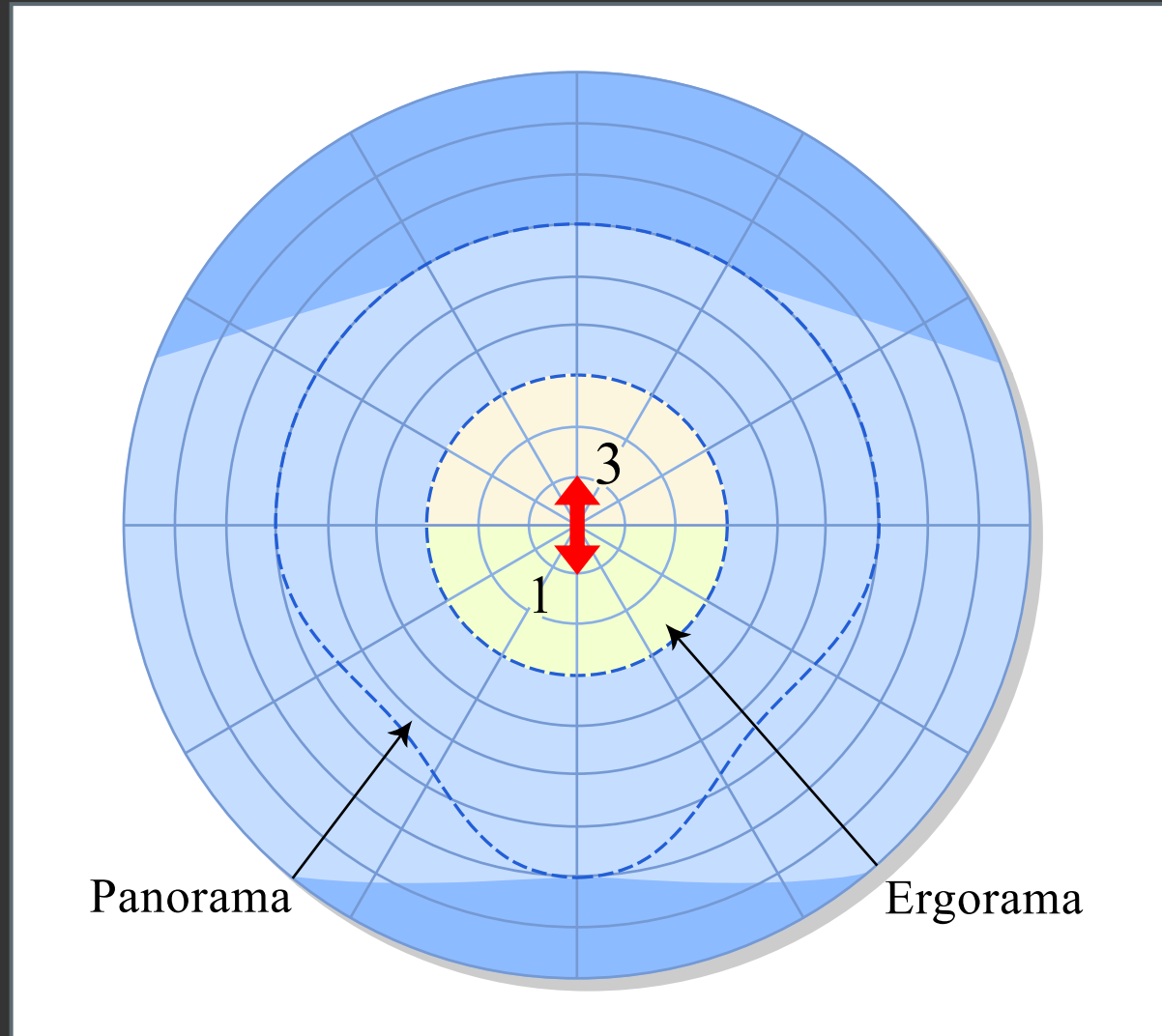


Figure by MIT OCW.

# Visual comfort

- ▶ Visual adaptation
- ▶ Visual field

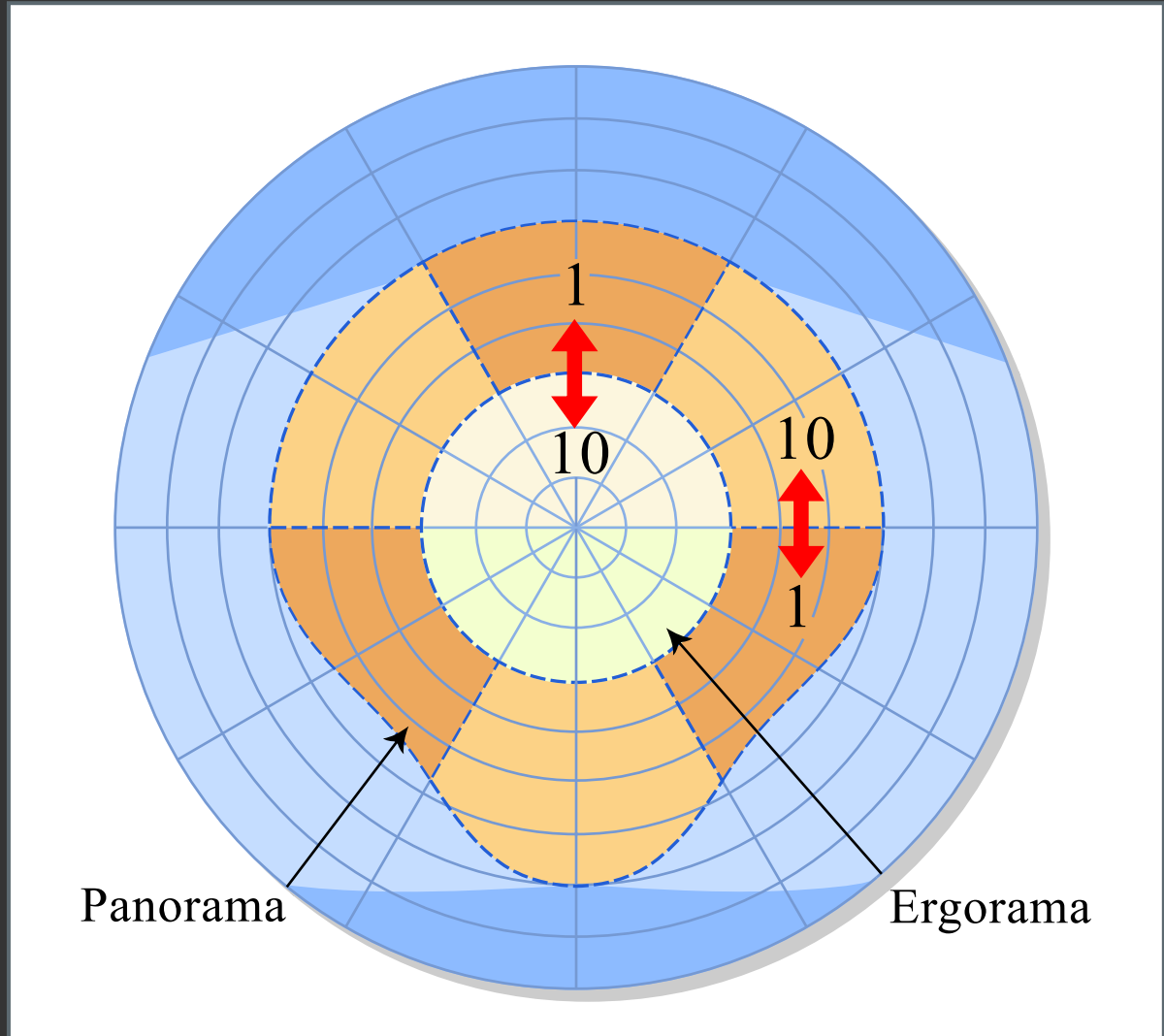


Figure by MIT OCW.

# Visual comfort

- ▶ Visual adaptation
- ▶ Visual field
- ▶ Visual performance
  - person & task
  - illuminance on work plane
  - luminance contrast
  - visual fatigue
  - example: work place



# Visual comfort

- ▶ Visual adaptation
- ▶ Visual field
- ▶ Visual performance
- ▶ Glare
  - physiological (disability)
  - psychological (discomfort)
  - sources:
    - glazed openings & sun patches
    - specular reflections
    - inappropriate electric lights

# Visual comfort

- ▶ Visual adaptation
- ▶ Visual field
- ▶ Visual performance
- ▶ Glare

- Glare indexes

BRS glare equation (or BGI)

Daylight Glare Index (DGI)

CIE Glare Index (CGI)

Unified Glare Rating (UGR)

New:

Daylight Glare Probability (DGP)

# Visual comfort

## ▶ Tractebel, Brussels

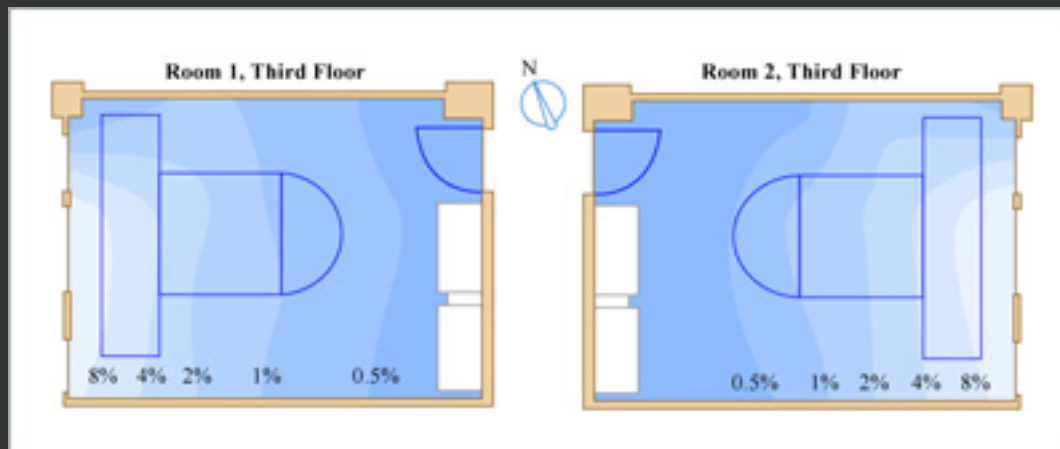


Figure by MIT OCW.

# Visual comfort

## ▶ Users' preferences

- natural lighting
- open view
- visual effects
- harmonious colors
- specific conclusions
  - daylight
  - sunlight
  - windows

# Visual comfort

- ▶ Users' preferences
- ▶ Daylight & health
  - intensity

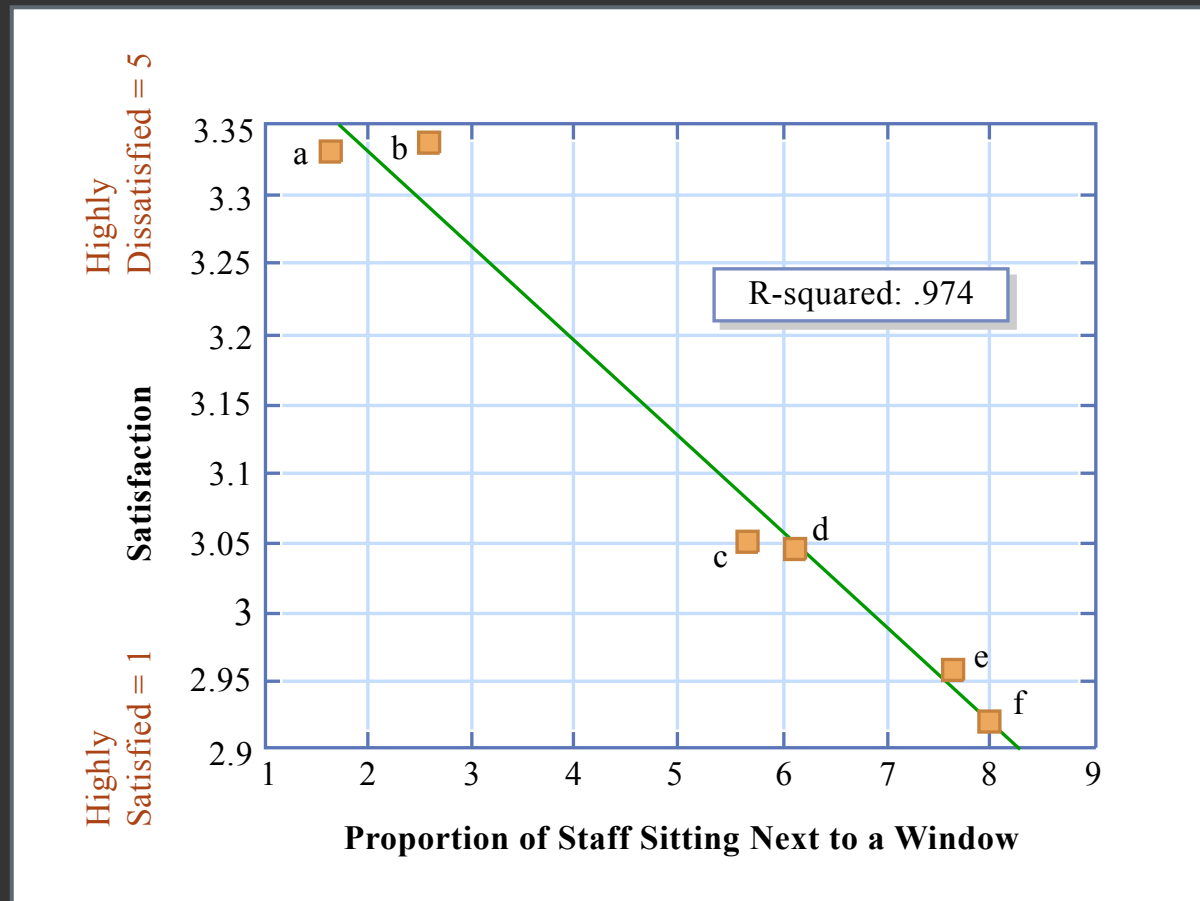
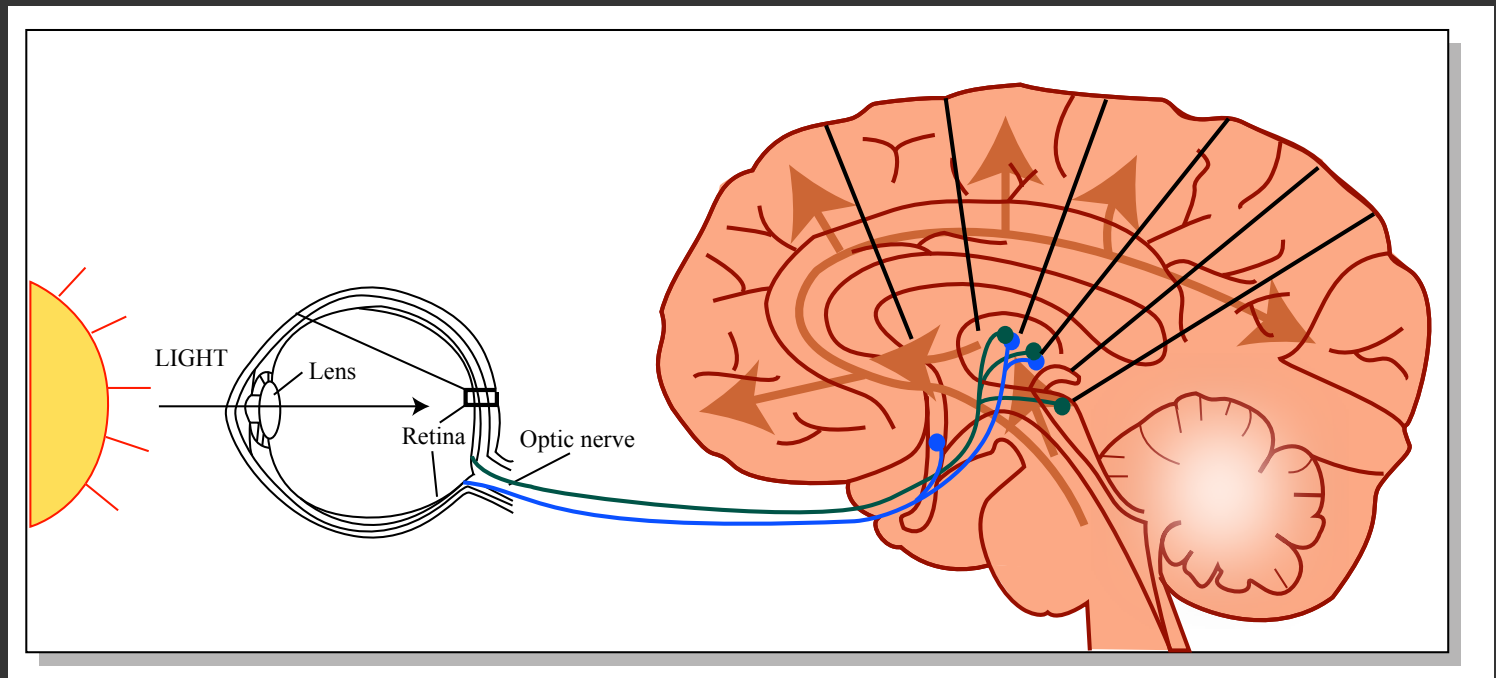
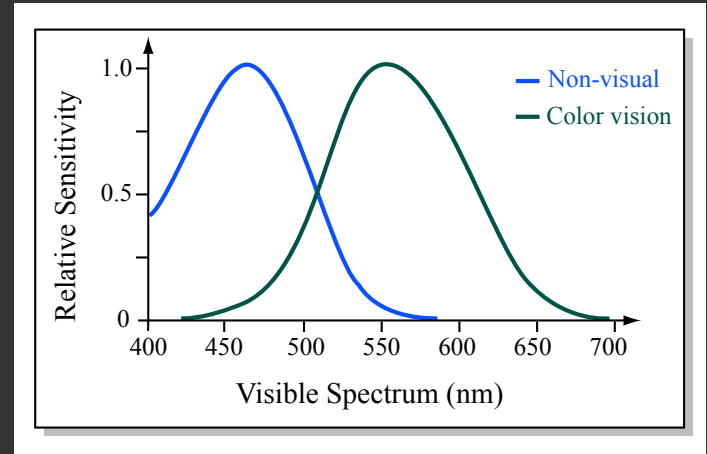


Figure by MIT OCW.

# Visual comfort

- ▶ Users' preferences
- ▶ Daylight & health
  - intensity
  - spectrum



# Visual comfort

- ▶ Users' preferences
- ▶ Daylight & health
  - intensity
  - spectrum
  - exposure to UV