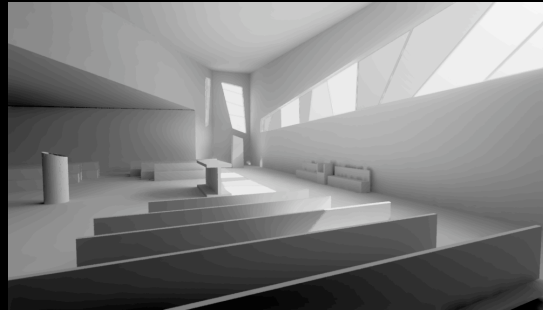
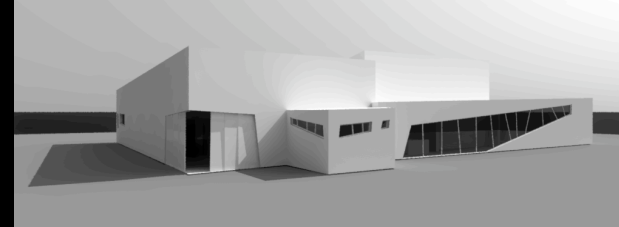
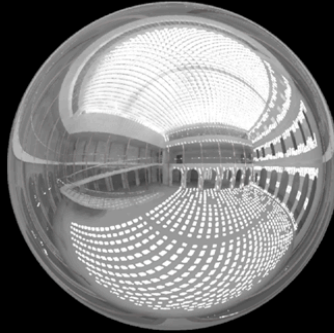
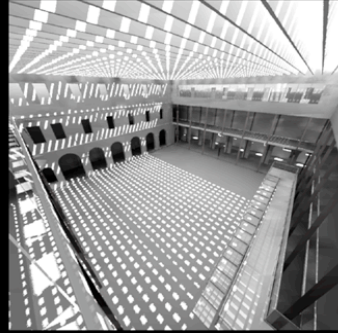
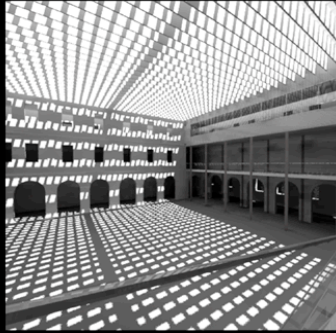
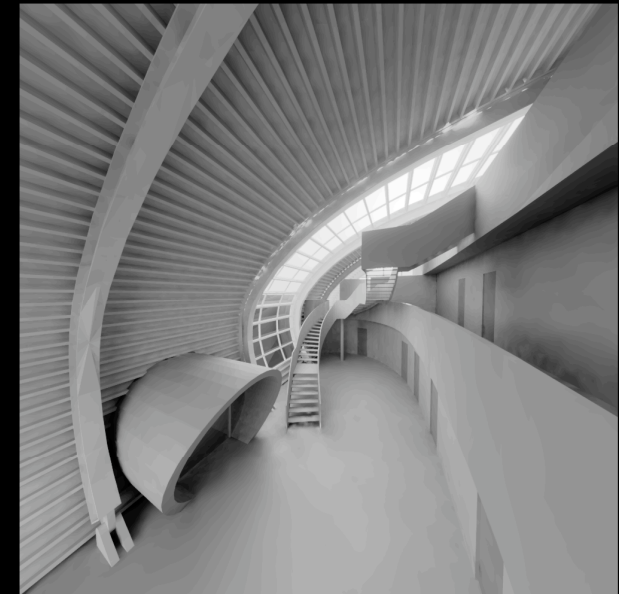
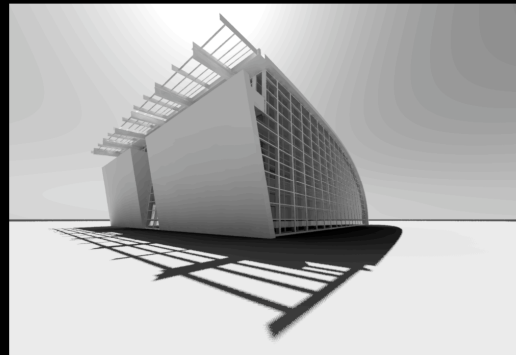


# RADIANCE WORKSHOP IN FRIBOURG - 2002

## DAYLIGHTING ANALYSIS



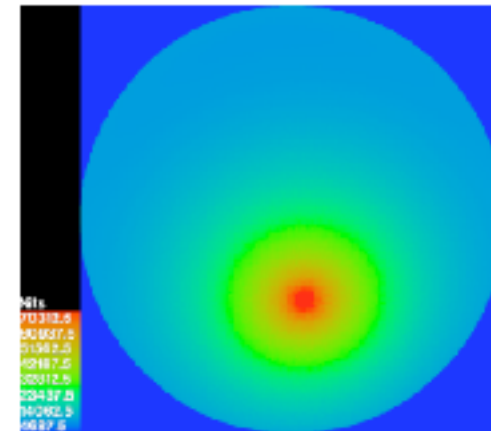
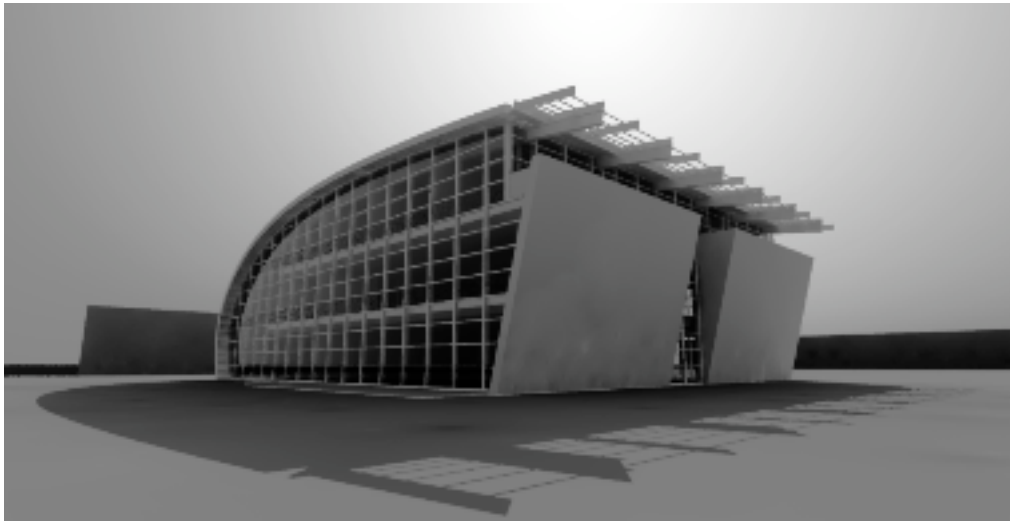
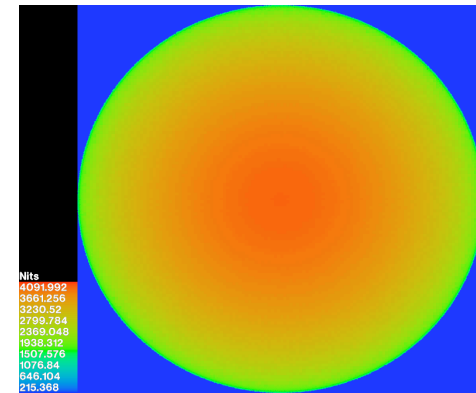
GIULIO ANTONUTTO FOI



## RADIANCE WORKSHOP IN FRIBOURG - 2002

### DAYLIGHTING ANALYSIS

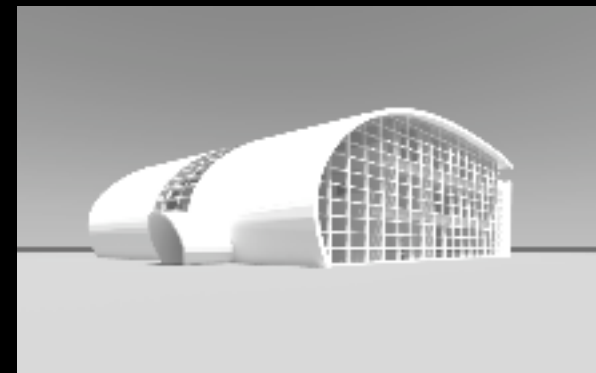
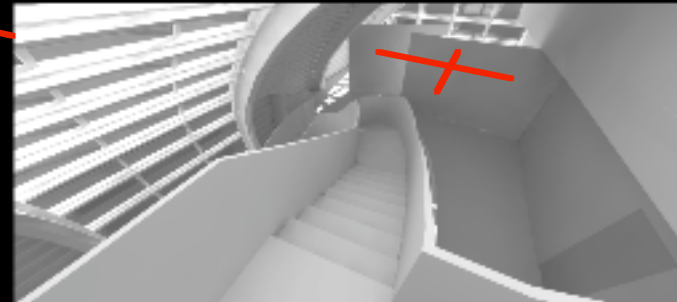
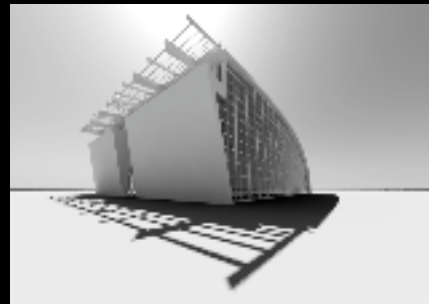
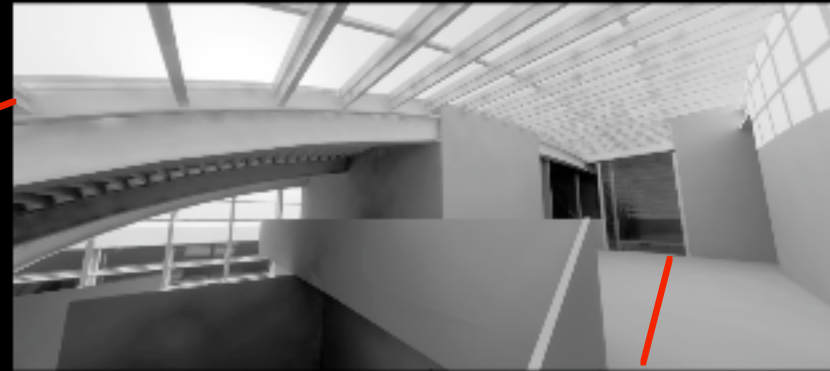
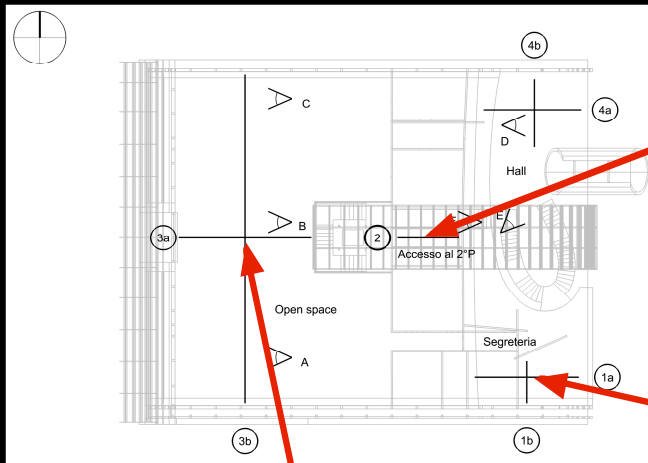
- DF calculation
- Mean illuminance frequency on workplane (energy savings)
- Solar study (solar animation + solar path diagrams)
- Glare prevention (DGI calculation, luminance maps)
- Visual appearance (rendering, animation)



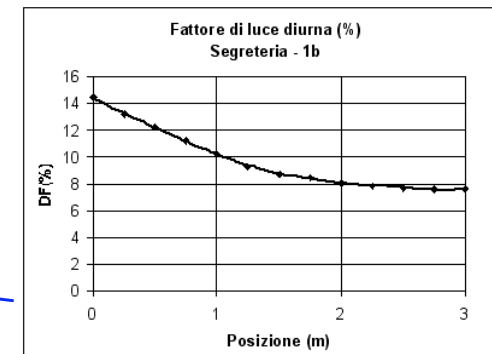
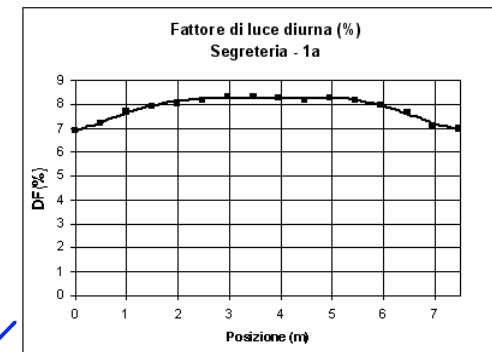
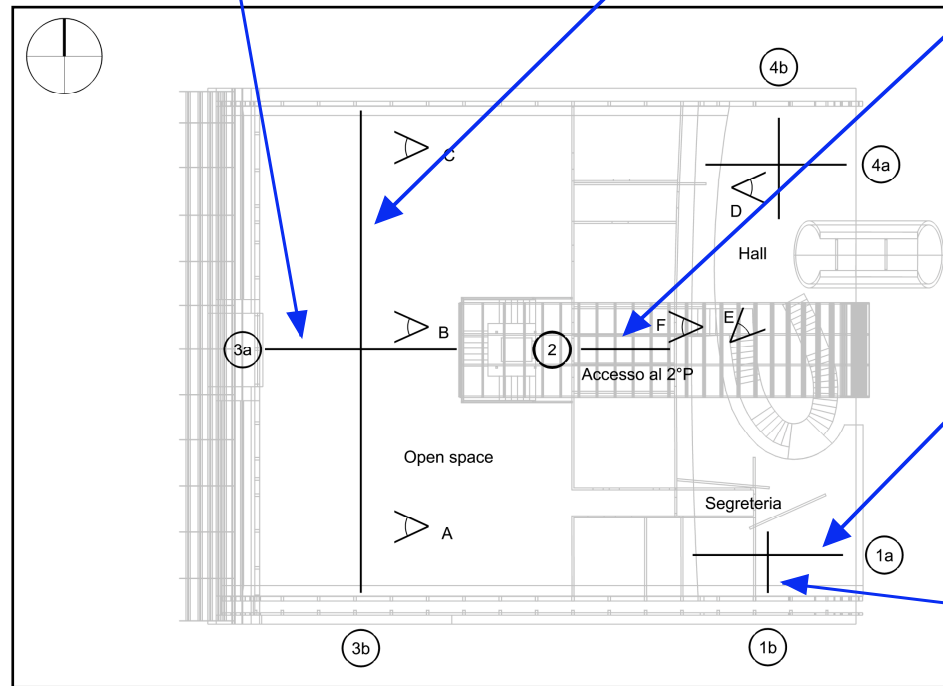
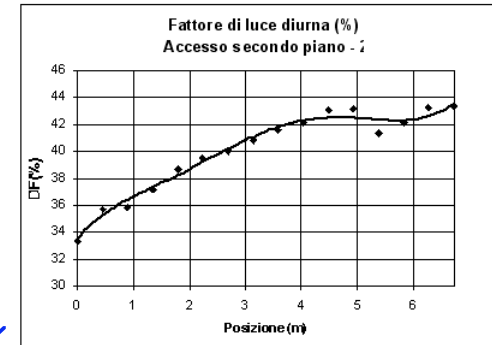
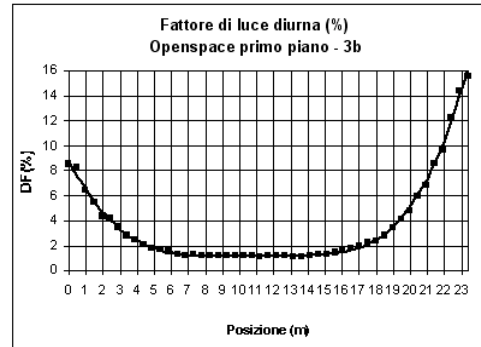
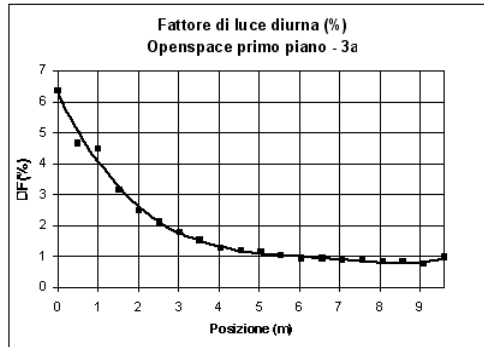
*GIULIO ANTONUTTO FOI*

# THE BUILDING

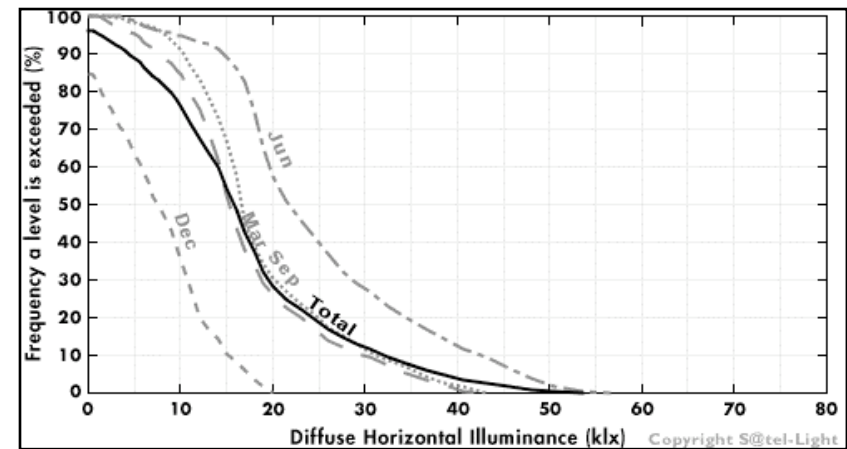
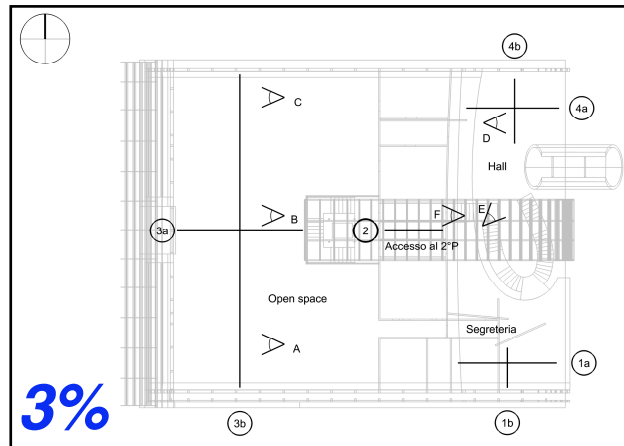
*Courtesy of TiFS Engineering*



# DAYLIGHT FACTOR ANALYSIS



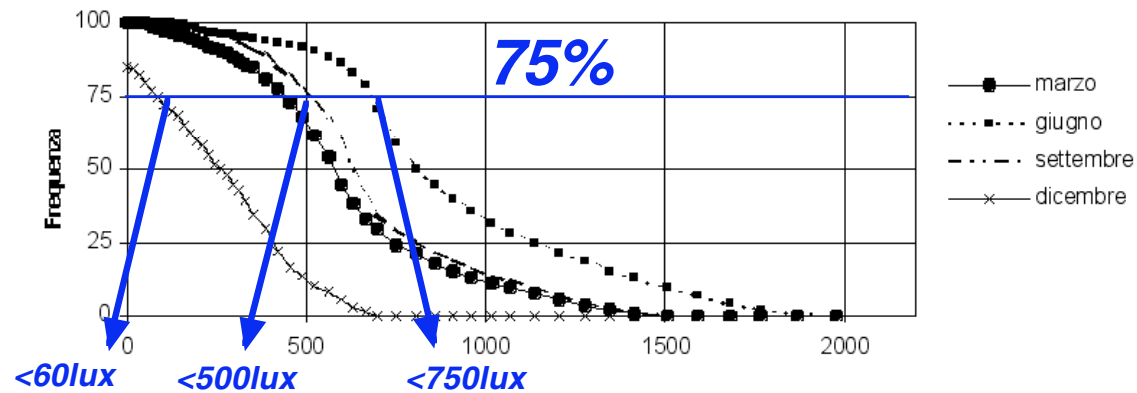
# MEAN ILLUMINANCE FREQUENCY ON WORKPLANE



Mean DF on workplane

Diffuse external horizontal illuminance frequency  
(from S@tel-Light)

Diffuse horizontal illuminance frequency



# SOLAR STUDY - SUN PATH DIAGRAMS

**SOLAR STUDY - SUN PATH DIAGRAMS**

rpict -vta...

...flip the image...

W

E

S

N

0° 10° 20° 30° 40° 50° 60° 70° 80° 90°

340° 350°

Jun 21

Jul 21

Aug 21

Sep 21

Oct 21

Nov 21

Dec 21

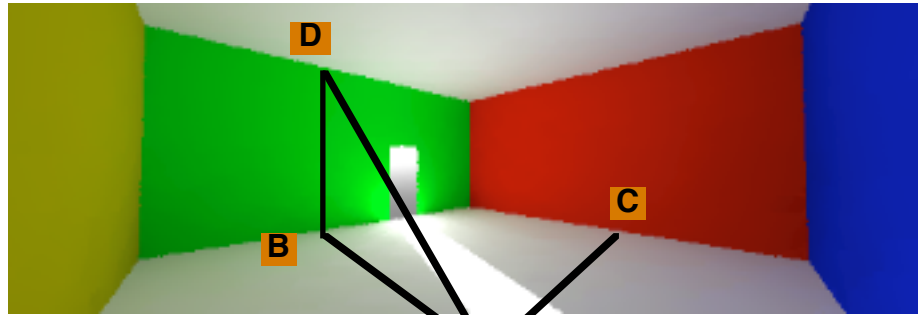
Time Shift

A

B

C

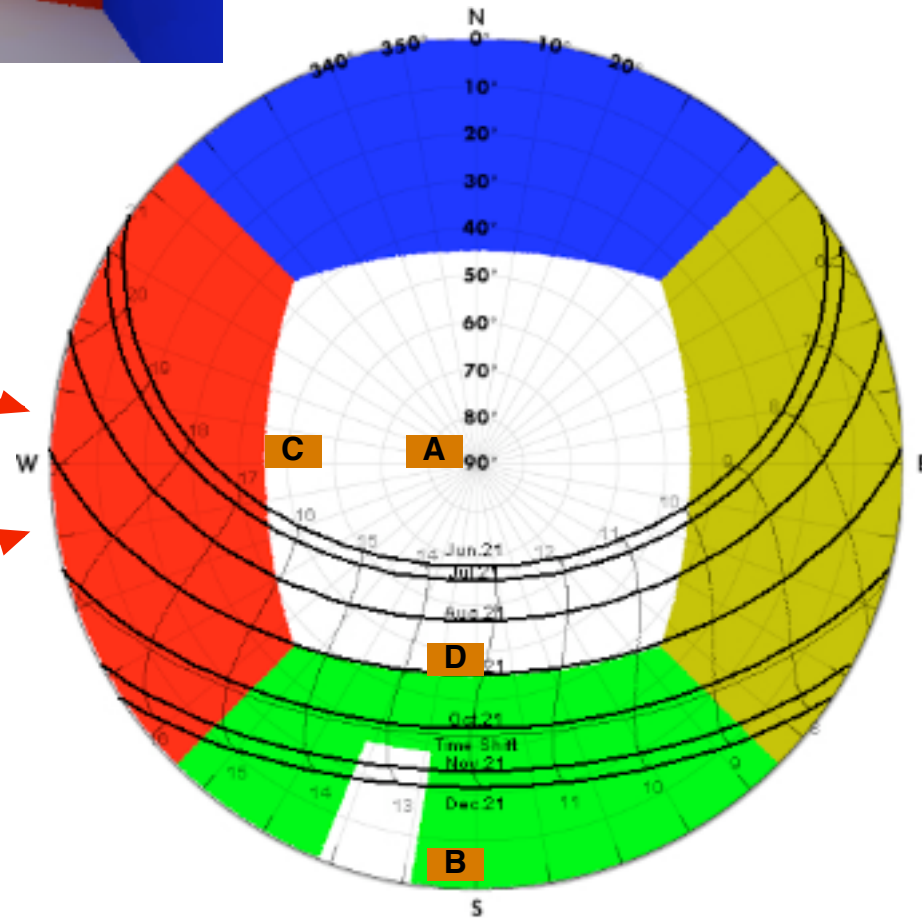
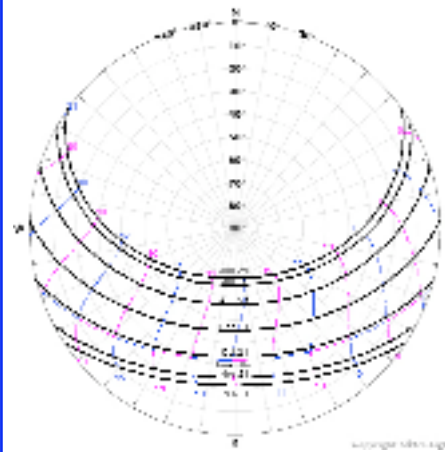
D



rpict (

**-vta...**

**...flip the image...**

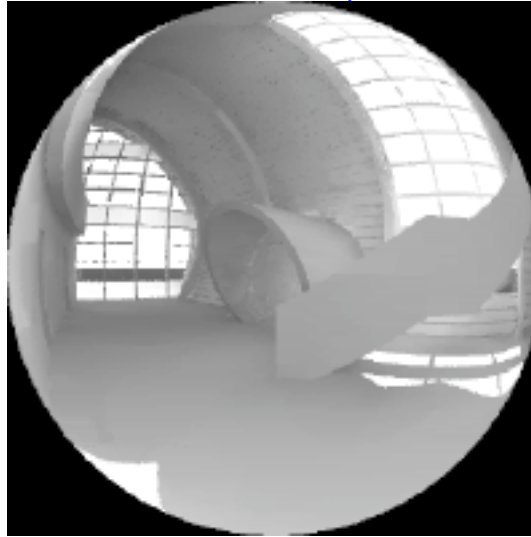
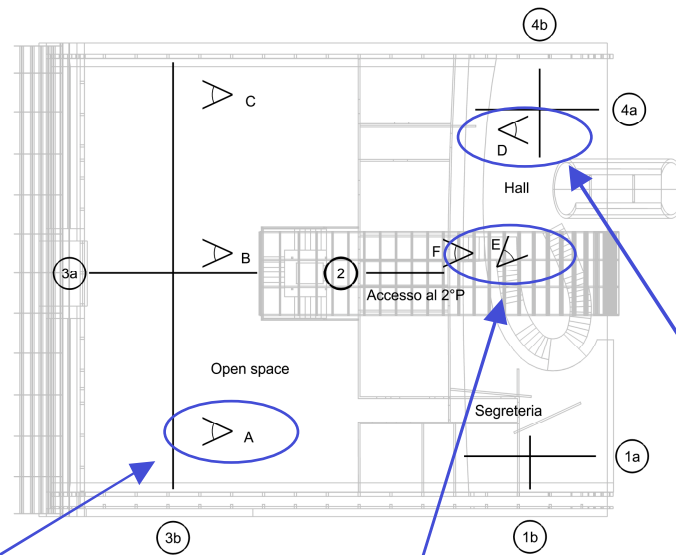




# SOLAR STUDY - SUN PATH DIAGRAMS

# SOLAR STUDY

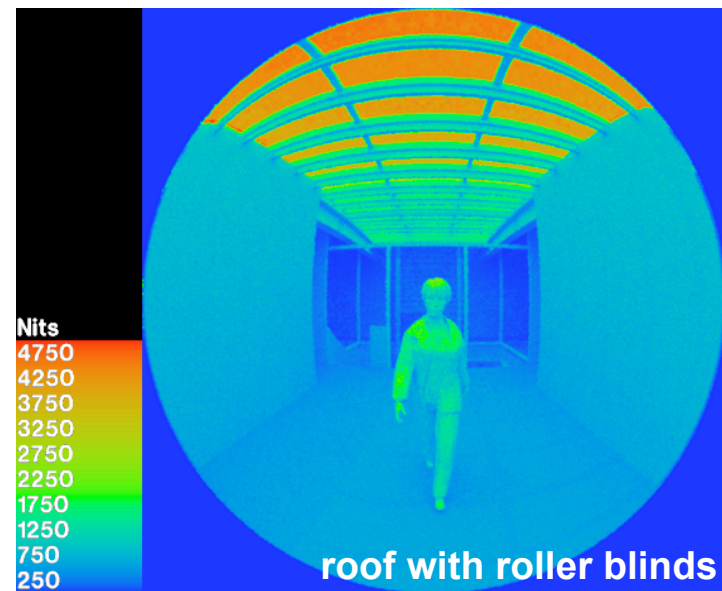
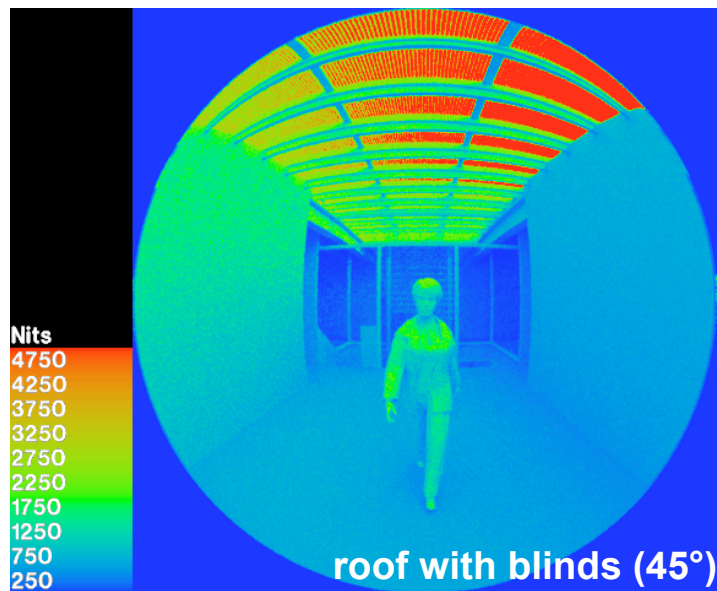
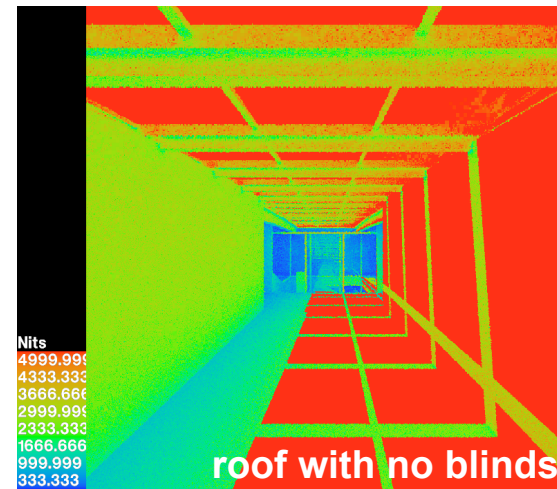
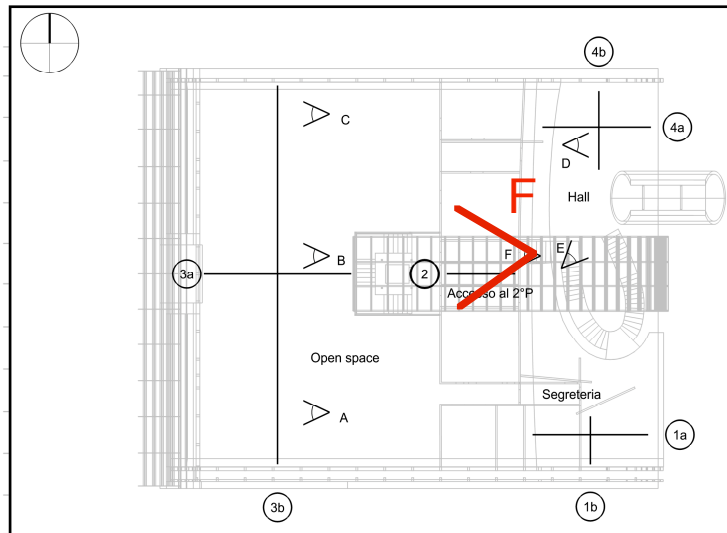
view "A" "D" "E", 21st of June - from 8:00 to 18:00



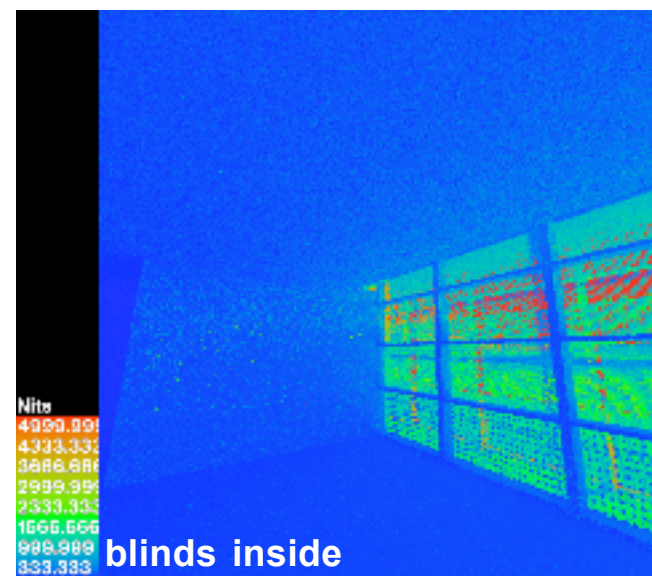
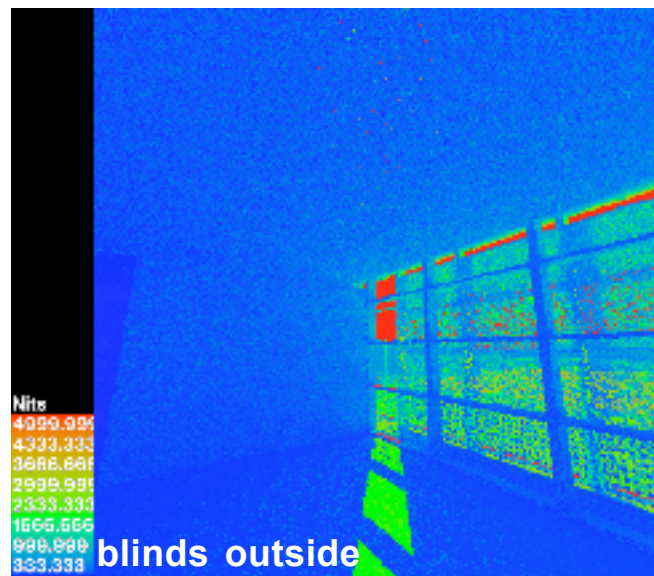
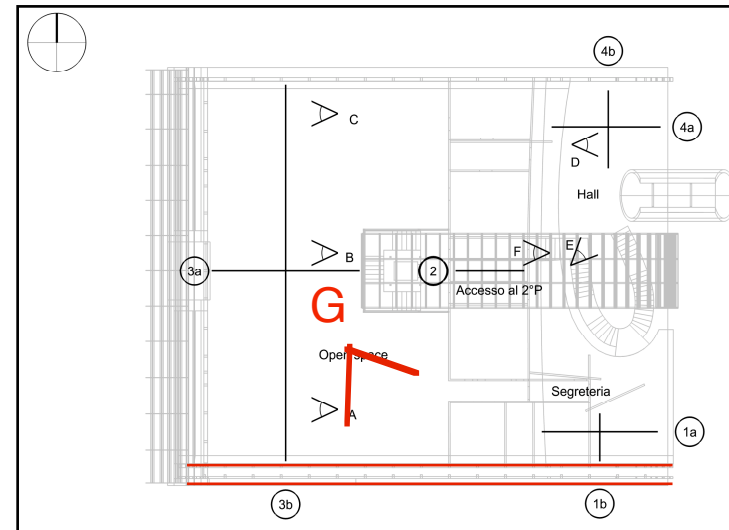
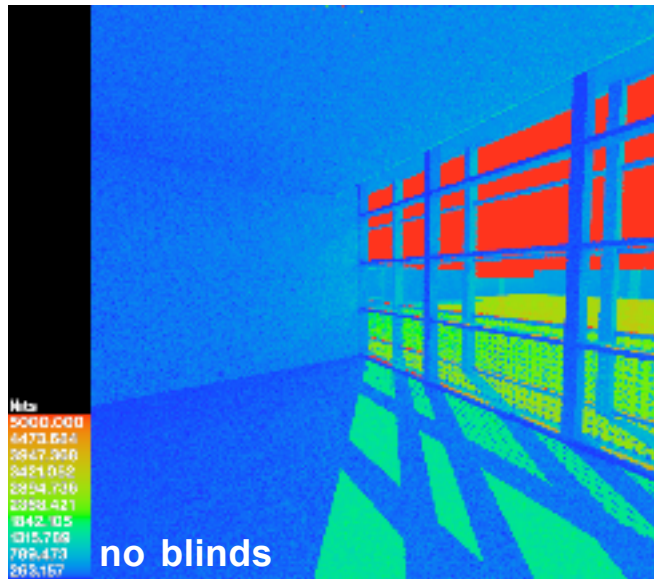


# GLARE

## LUMINANCE MAP IMAGES - view "F" - 21st of June, 12:30

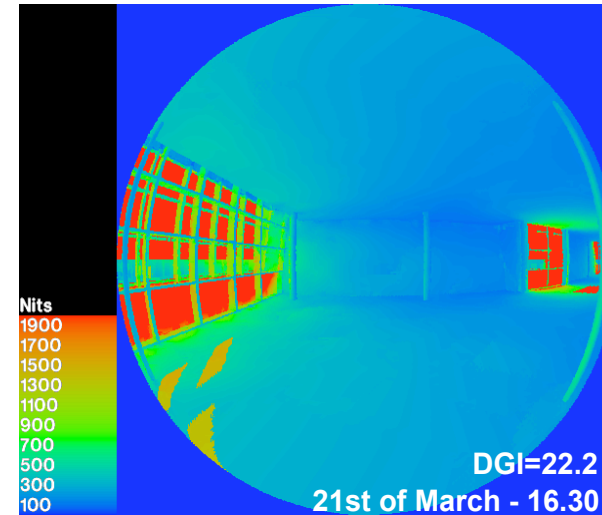
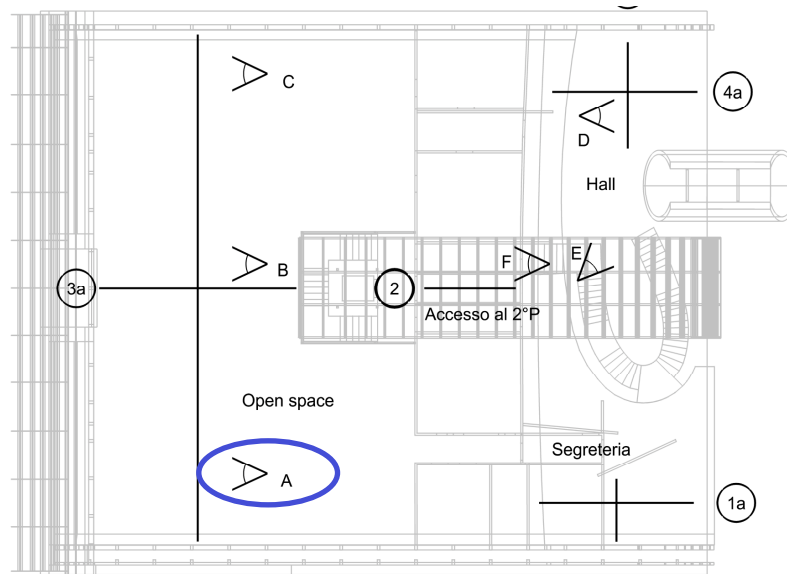


# GLARE - luminance maps images, view "G", 21st of september, 9:30

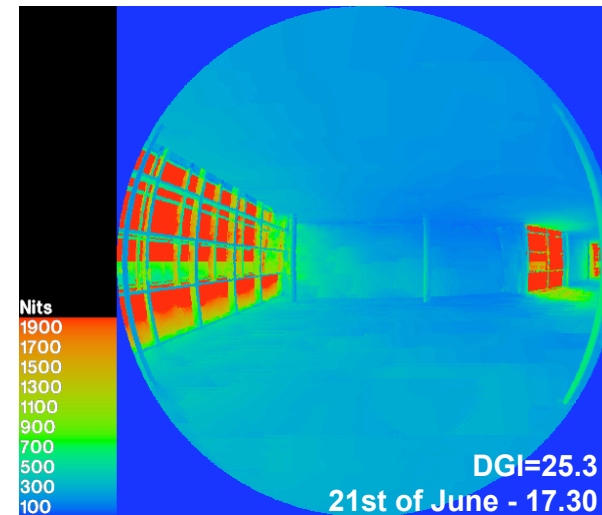


# GLARE

DGI calculation - view "A", 21st of December, March, June, September - from 8:00 to 18:00



View A	December	March	June	September
7:30	0.00	20.84	17.64	16.90
8:30	12.76	18.39	17.58	17.00
9:30	6.22	20.36	19.53	17.34
10:30	7.34	17.52	16.04	17.58
11:30	12.32	18.08	16.79	18.60
12:30	12.16	18.16	17.52	18.51
13:30	14.39	17.61	14.71	18.61
14:30	17.84	19.41	17.71	19.34
15:30	20.65	20.78	21.06	20.78
16:30	14.59	22.20	21.95	22.20
17:30	0.00	20.86	25.27	21.00
18:30	0.00	12.49	24.74	17.64



## **THE BUILDING - SOLUTIONS TO PROBLEMS**

- USE OF PRISMATIC PANES ON GLAZED ROOF TO AVOID GLARE PHENOMENA**
- VENETIAN BLINDS INSIDE OF DOUBLE GLAZING FACADE TO TO AVOID DIRECT SUN PENETRATION**
- SEPARATE SETTINGS FOR LOWER AND UPPER PART OF VENETIAN BLINDS TO ALLOW THE REDIRECTION OF DIRECT SUN RADIATION INSIDE OF ROOM BY REFLECTION ON THE CEILING**