



**Resume: Scenario into the light** . Portugal

**Designing light through order and complexity** to chaos or no limits:

Improve imperative synthesis.

Define Hypothesis with students (?):

- Introduction to sense of light from Rudolph Arnheim to Andrea Branzi
- Ability to paper mock-up (fold and unfold)
- Retrospective about vanguards filmes
  - Man Ray (Le Retour á La Raison . 1923)
  - Marcel Duchamp (Anemic Cinema, 1926) and
  - Fernand Leger (Ballet Mechanic . 1924).

*Improve the ideia of balance and the sense of **experience animation through light**.*

See light through Bruce Munro Artist installation;

*Results Acting and Performing a light peregrination or a light field trough a light structure construction (DYI).*

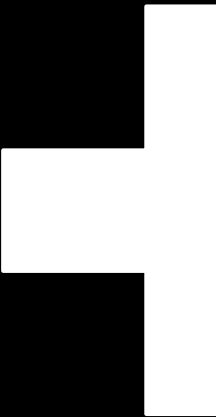
- Developing the **sense of light** and his manifestations through bi-dimensional to tridimensional;
- See light through Turner, Monet and the minimalist sculpture artist Dan Flavin eyes.
- See light through Typographic structures: from Massimo Vignelli to Neville Brody
- See light through Designer of Light Ingo Maurer;
- Integrated with STEM Concepts: laws of light, properties in materials, modular to create a pattern through repeated elements
- To solve Problems and Needs: structure lightness
- For target group(s): students aged 15-25 in design STEM projects

# step A

Worship, gods  
and the  
influence of  
**light**

Starting with the  
silent piece with John Cage

<https://www.youtube.com/watch?v=JTEFKFIXSx4>



# path A



(c 28,000 BC)  
In the Ice Age snow 30,000 years ago, Cro-Magnon artists used natural pigments to create primitive paintings. In Lascaux, France. The man must have used fire to have the light necessary to create the art of the many paintings found there where daylight is impenetrable.

Altamira in Spain there are also magnificent exercises of this reverence.



STONEHENGE (2000 - c 1500 BC)  
Worship of the sun soon became part of civilization ... Stonehenge was built on the Salisbury Plain (England) approximately between 2000-1500 BC. ... of stones and other existing landmarks, archaeologists have long confused their meaning ... until in 1963  
Dr. Gerald S. Hawkins, (astronomer) showed in (with the help of computers) that the stones were aligned to indicate the solstices and the beginning of seasons, and to predict eclipses of the sun and moon.



RA (THE GOD OF THE SUN) - (c 2300 BC)  
Ancient Egypt.  
(3000 BC)  
+- 100 million people.



(c 5000 AC)  
Fuel as olive oil was probably the most used in lighting especially in countries in the Mediterranean basin, where the abundance of oil was higher, but other oils served the same purposes: walnut oil, fish oil, castor oil and other plant oils.

# result A

Worship,  
gods and  
the influence of light

Go around...  
where you live  
and retain the essence of light in the beginning of  
or the end of the day in a church or a sacral place  
for yourself...  
...look for natural light inside this places...

**How it works...?**

**How it transforms the space inside...?**

**What meaningful aspects of light are introduced  
in this places...?**

Bring photographs and share...your experience and  
meaning of light inside this places.



Jacinta Costa in a Church in Caceres (Spain)



Edinburgh (Scotland) 2017



Helsinki (Finland), 2009



# step B

‘If we had wished to begin with the first causes of visual perception, a discussion of light should have preceded all others, for without light the eyes can observe no shape, no color, no space or movement’.

Rudolph Arnheim

Arvo Pärt (1935): Lamentate

Homage to Anish Kapoor and his sculpture ‘Marsyas’ (2002)

For piano & orchestra (3.2.2.2 - 4.2.2.0 - timp, 4 perc - strings)

<https://www.youtube.com/watch?v=woaKxGwdyBw>



# path B

‘The paintings in our galleries are seen one day in bright sunshine and another day in the dim light of a rainy afternoon, yet they remain the same paintings, ever faithful, **ever convincing**. To a marvelous extent they carry their own **light within**. For their truth is not that of a perfect replica, it is the truth of art.

Ernst Gombrich

The essays / books from Rudolph Arnheim and Ernest Gombrich and eventually J.J. Gibson (The Ecological Approach To Visual Perception) give us a good perception in the interpretation of light. Gombrich transports us to see light through the eyes of the great masterpieces and classics (specially in paint) and Rudolph Arnheim uncovers perception of **light** pointing out a speech that is needed to understand the bases and concerns that give us meaning when you design something.

# results B

See the book of Rudolph Arnheim,  
look through light symptoms  
regarding light perception:

- The Experience of Light
- Relative Brightness
- illumination,
- Light Creates Space
- Shadows
- painting without lightning
- The Symbolism of Light

Link this items to your experience, transport it to class  
discussion:

Link:

[https://monoskop.org/images/e/e7/Arnheim\\_Rudolf\\_Art\\_and\\_Visual\\_Perception\\_1974.pdf](https://monoskop.org/images/e/e7/Arnheim_Rudolf_Art_and_Visual_Perception_1974.pdf)

Ccc aboutit Worship, gods and the influence of **light**





# step c

‘There is a light  
that never goes  
out’

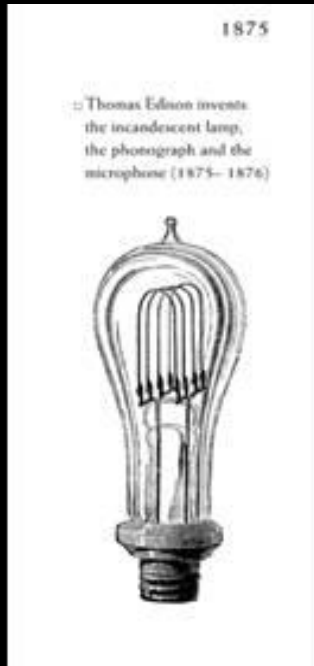
The Smiths, The Queen Is Dead, 1986



# path c



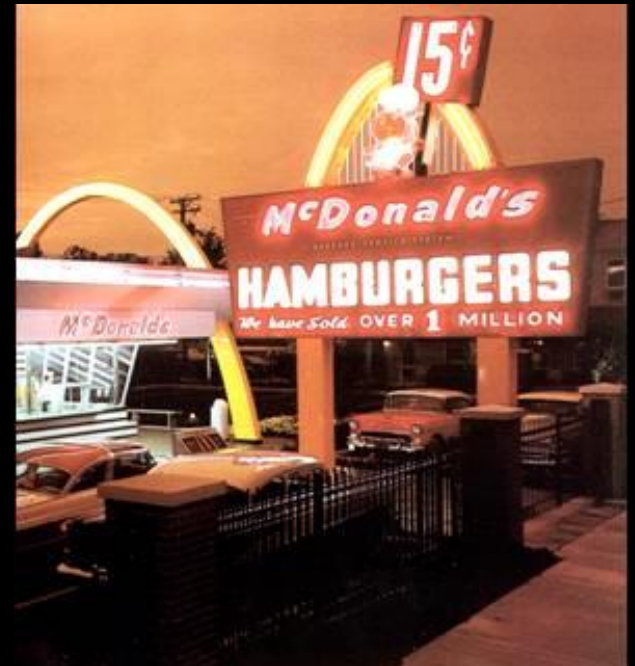
1807  
Lighting publishes Gas in  
London  
1819  
Lighting Publishes Gas in  
Paris



Thomas Edison  
First  
incandescent  
lamp  
1875



AEG  
1910



50's Neon  
1955 American Way of Life

# path c



## reference

*Cities in dust...*

### Path 3:

If you have time see a film about people and the city... like *Wings of Desire* from Wim Wenders (1987).

What city is this? Which persons live how do they cross cities? Which shadows do they possess?

Find your shadows in the city, find your color light mood from a street and then transport this light to images.

# path c

## reference

*Cities in dust...*

### Path 3:

Look for **Henri Cartier Bresson** pictures and see the ability to kept the moment of the city...



# C reference

*Cities in dust...*



J.M.W. Turner,  
"Shields, on the River  
Tyne," 1823

## Path 4:

Are you uncertain yet?

See Turner Mood light paintings or  
Claude Monet hundred's paintings  
regarding Notre Dame Light....

What was their intentions...?

What do they want to prevail?

What was their perception of light in  
different epochs and periods of art  
history?



**‘Paint what you really see, not what you think you ought to see; not the object isolated as in a test tube, but the object enveloped in sunlight and atmosphere, with the blue dome of Heaven reflected in the shadows’.**

Claude Monet

# results c

Pic your pencil or your camera (including your camera in your phone), and start drawing or photograph the city...

Through Claud Monet, Cartier Bresson or Wim Wenders, it does it matter, transport me to the way you see the city **light**: people, public space, atmosphere.

Bring  
The  
Class  
Your  
Images

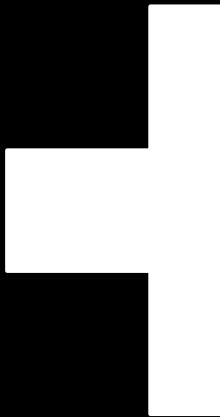
# step d

Let's go back

What about technology  
in light performance....

Ausencia, singer from Cabo Verde Cesária Évora e Goran  
Bregović (Serbian musician)

video<https://www.youtube.com/watch?v=mPecA4qmywM>



0

At first it was dark and cold and there was no sun, no light, no earth ... no solar system. There was nothing, just the void without space ... so slowly, about 4.5 billion years ago ... a huge cloud of gas and dust was formed ... Big ... Bang.



# 1



Stars, galaxies, thousands of planets and systems, temperatures, pressures, winds, fusions of hydrogen atoms have thus created complex structures and an infinite universe where we ... humanity as the beginning and end of our existence, subdued by our limits and by the attentive look of "small" telescopes we try to define this three-dimensional space from mathematical models sometimes deductible sometimes and only reflection of our historical experience of learning to try to be a man.

*Little path* : [Read Carl Sagan and Cosmos](#)



## 2



As you already know...the sun is an atomic furnace that transforms mass into energy, every second converts more than 657 million tons of hydrogen into 653 tons of helium, discharging 4 million tons of energy into space. The earth receives a tiny percentage of this energy.

Scientists estimate that their life span could be 10 to 30 billion years.

It has been calculated that in 15 minutes the sun erodes as much energy as human society consumes in every possible way for a whole year.

The sun is about 149,000,000 kilometers from the earth, is 1,390,000 kilometers in diameter, and is only considered a 'average' star size, brightness and age. There are over 100 billion other stars in our Galaxy. The sunlight takes about 8 minutes to reach the earth.

[https://www.nasa.gov/mission\\_pages/sdo/news/first-light.html](https://www.nasa.gov/mission_pages/sdo/news/first-light.html)



<http://www.light2015.org/Home/ScienceStories/A-Brief-History-of-Light.html>

3

FIRST the man and his evolution from quadruped to biped ... .. HOMO ERECTUS approximately 1 million years before Christ (BC) MAN (c 500,000 BC) The sun as the source of life and light, represents for years a god, whereas the moon was considered a minor god

4

FIRE, FLAME AND TORCH - (c 400,000 BC) Homo Erectus probably discovered it unintentionally by falling from a thunderbolt into a tree by the friction of two stones ...

The campfire was probably one of man's earliest experiences in attempting to subdue his fears, his enemies, the hunts, the gods, the caves. Thus was introduced the first concept of using artificial light, releasing himself from the fears of the night, ensuring greater safety by putting a start in the use of fire / light in his first paintings in rock caves.

5

The torch was the first portable lamp. One of the first switches was a long process of friction with sticks and a few dry branches, so a torch was made prolonging and dominating the one that will be the great driver of its development ... to control the light ... and the fire.



6

(c 13,000 BC)

Prehistoric man used primitive lamps used to illuminate the caves. These lamps, made of natural materials like stones, shells, horns, were filled with grease and a vegetable fiber wick. Table lamps could be made with animal or vegetable fat as fuel. Hundreds of these lamps (stones with holes) were found in countless caves approximately 15,000 years ago.



7

AGRICULTURE - (c 8000 BC)

About ten thousand years ago, the man made an incredible discovery ... from nomad and hunter to a more stable life as a farmer (sedentarization), he realized that he could cultivate, harvest and have provisions for times of lesser abundance. Perfecting your education in the use of light (fire), creating a new freedom.



8

Animals as light sources (5000 AC)

Animals and their fats were sometimes excellent sources of light ... birds with lots of oils and fish were stuffed with a wick to work as lamps. Also in the Indies (and also in Japan) ... there are records of the use of numerous quantities of fireflies providing for man a convenient source of light by bioluminescence processes

Safer research places the invention of glass in the third millennium before the birth of Christ in Mesopotamia (in present-day Iraq and Syria), running small objects, ... hollow containers do not appear before ... about 1500 BC.

Sometimes the first glasses appear in the form of small tubes called fulgurites, ... there is also tektite, small objects, rounded glass that have formed with the result of the meteor strike on Earth. The most common glass has the name of

obsidian, bright and dark, is born in the fires of volcanoes and was used first to make tools more than a million years ago.

The Romans introduced glass through the art of blowing about 50 BC.

See the small glass Egyptian flasks

<https://www.virtual-egyptian-museum.org/Collection/FullVisit/Collection.FullVisit-JFR.html?../Content/GLS.LL.00693.html&0>



## 10

Besides the long time discover of wax and candles, the continuous endless use around middle age was only interrupted after 1790 with tools and objects to domain fire produced in large scale.





# 11

After Humphrey invention, the first streets in London and in Paris were illuminated permitting the continuous adventure to walk at night and see at night.

1807 Lighting public street with Gas in London

1819 Lighting Public Gas street with in Paris

1825 Public train transport, Darlington and Edinburgh street lamp by ccc



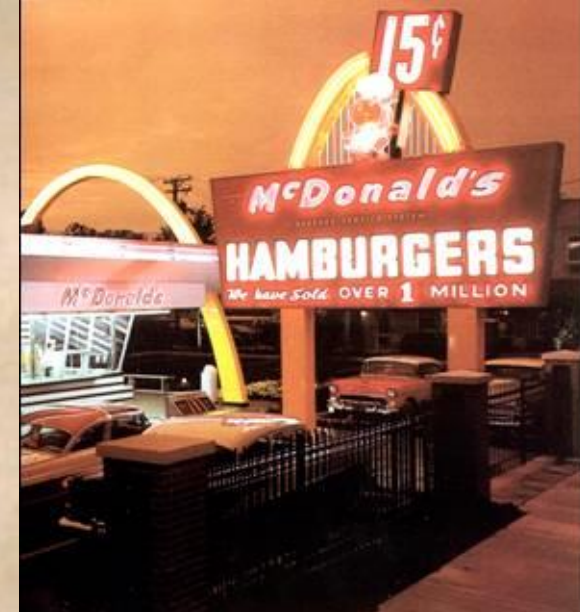
12

Edison transport us to a new dimension, and the domestic landscape embraced quickly that amazing invention...

1875  
Thomas Edison invents the incandescent lamp, the photograph and the microphone (1875-1876)



AEG  
1910



50's Neon  
American Way of Life . coming



## 13

Burning since June of  
1901,....



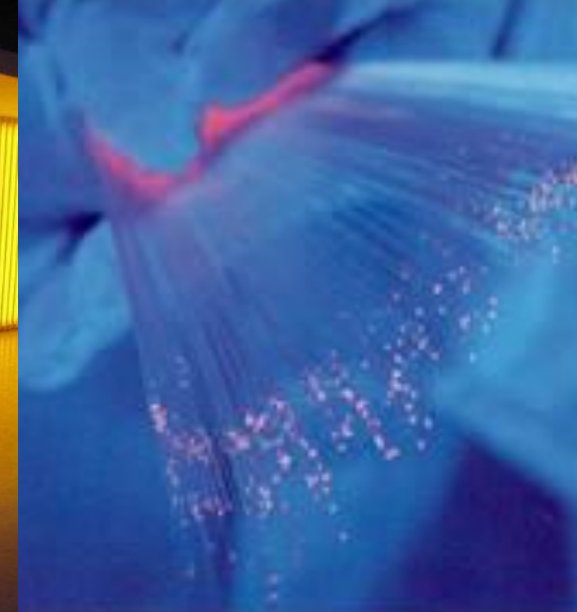
# 14

The Fresnel source light with mirrors as been applied along wall the coasts to prevent maritime accidents...





The Fluorescent lights never been the same after the minimalist Dan Flavin (60's) create his masterpieces concerning light installations, also, men's evolution never stayed the same after optical fiber being applied to light structures and to improve communications.





Lazer applied in several fields from technologies instruments, to medicine or concerts like Radiohead in 2009.

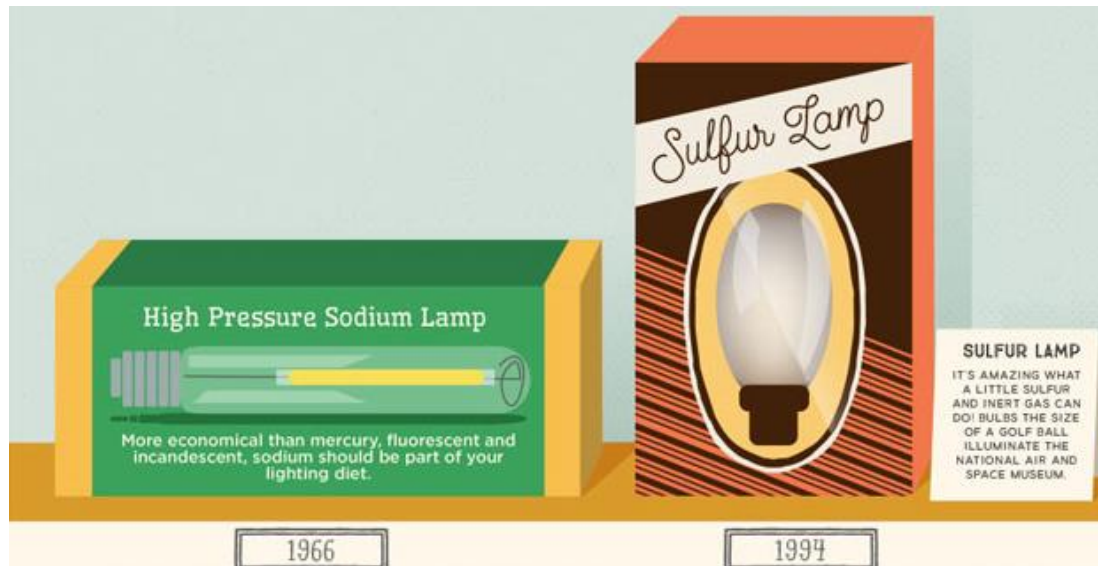


Radiohead Concert 2009



Lazer - Theodore Maiman\_ 1960







# step for a break

*animated Path*: about our favorite graphiter Blu (Bologna - Italy):

"BIG BANG BIG BOOM - <https://vimeo.com/13085676>

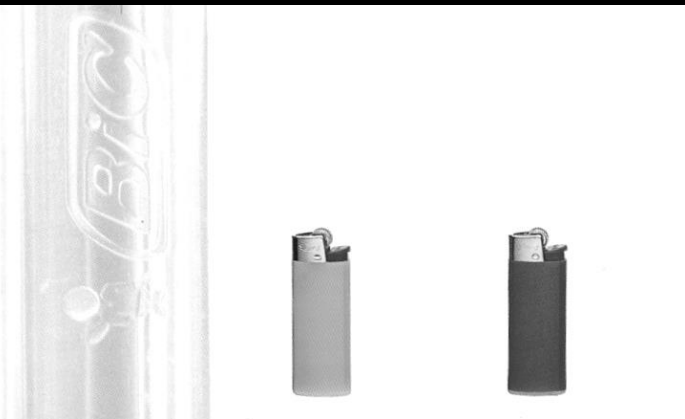
*an unscientific point of view on the beginning and evolution of life ... and how it could probably end.*

*direction and animation by BLU .*

<http://www.blublu.org>

production and distribution

sountrack by ANDREA MARTIGNON



Series Production 1953  
BIC\_ initially pens after lighters





Energy Grid  
Systems  
structure

From classic Fresnel Light  
Navy security to Vestas Light  
Aviation Signals





Celebration in  
S.Fermin | Bilbao -  
Spain



Changing light  
Bulb in Empire  
State Building  
New York

7.000 watts Lights |  
xénon Casino  
Piramide Luxor |  
Las Vegas



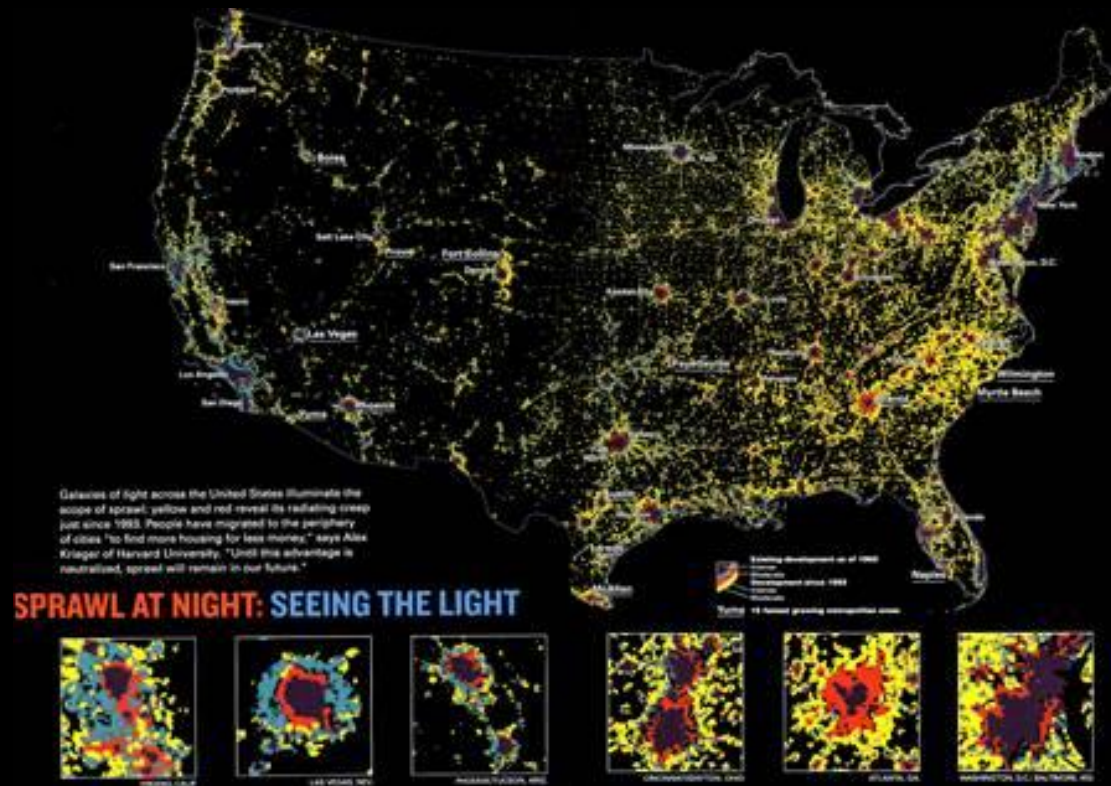




Renzo Piano  
Hermès Tokyo – Torres de Vidro  
1999



2000 Milénium | Paris





192 laser's direct\_ fusion nuclear light induced  
National Ignition Facility- California

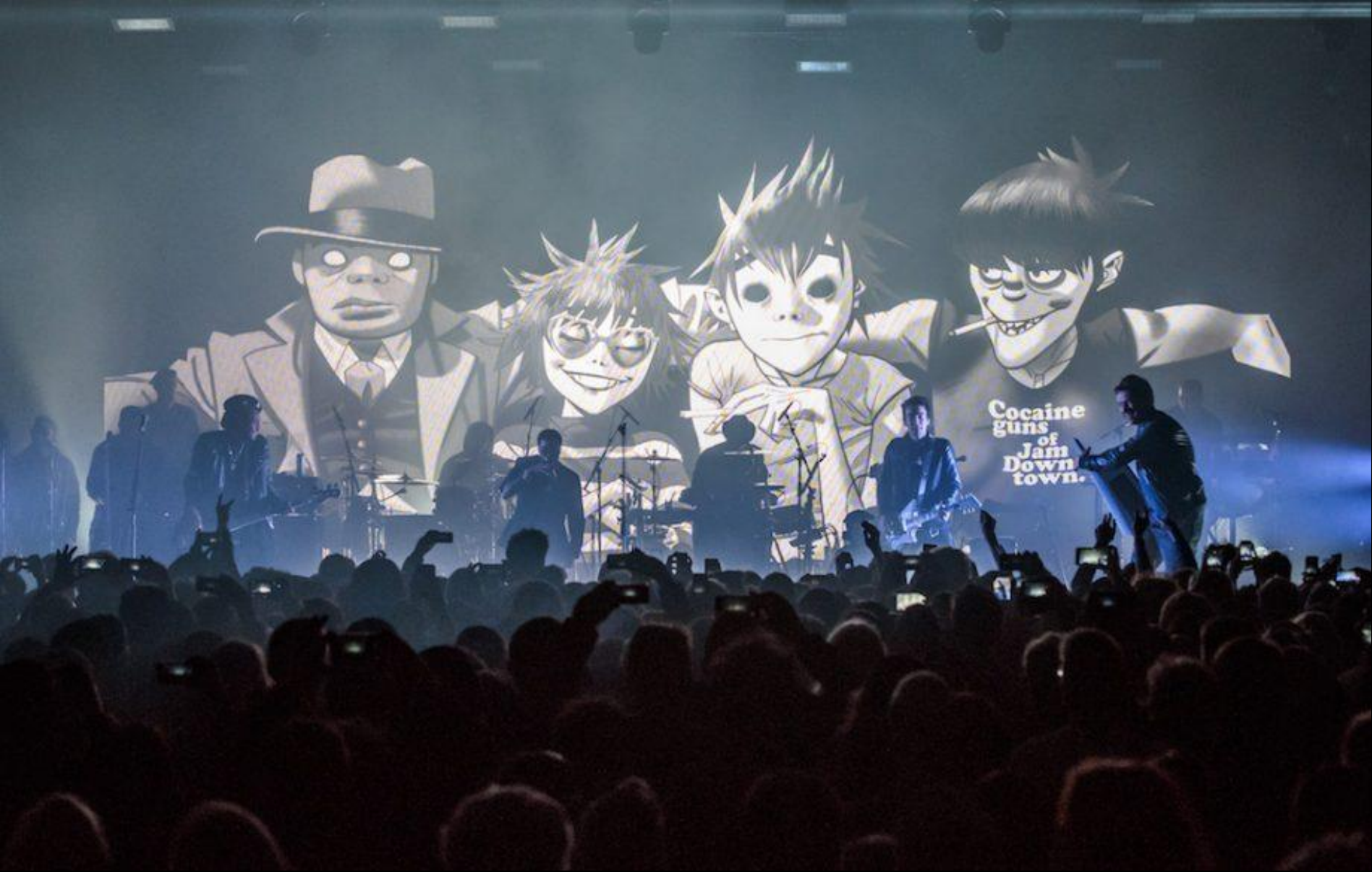


UV Exposition





Clients in Health Center Aachen  
High-tech, exposing to light UV  
Treatment anti-stress and insomnia



Gorillaz Concert show demon days . 2005  
<https://www.youtube.com/watch?v=7x1H1FBID00&t=8s>

# step e

explore and experiment light in  
laboratories (light speed, laser,  
refraction, reflection, electromagnetic  
spectrum, radiation, waves and  
particles, uv light, Neon, Xenon

Nina Simone | Love or leave me  
[https://www.youtube.com/watch?v=GEQpipS\\_qfc](https://www.youtube.com/watch?v=GEQpipS_qfc)

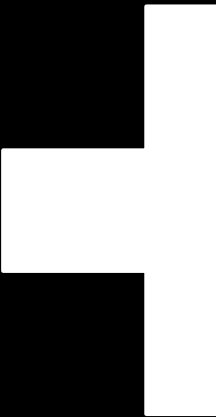


# step f

“Light can be sensual; it can be comforting; it can even be dangerous. It goes beyond science or nature, or even art – it is as potent as life itself.”

Ingo Maurer. German Designer of light

<https://ingo-maurer.com/en/>



# path f

Approach to designers eye's  
**light design** and the living domestic  
landscape...from Gallé to Maurer



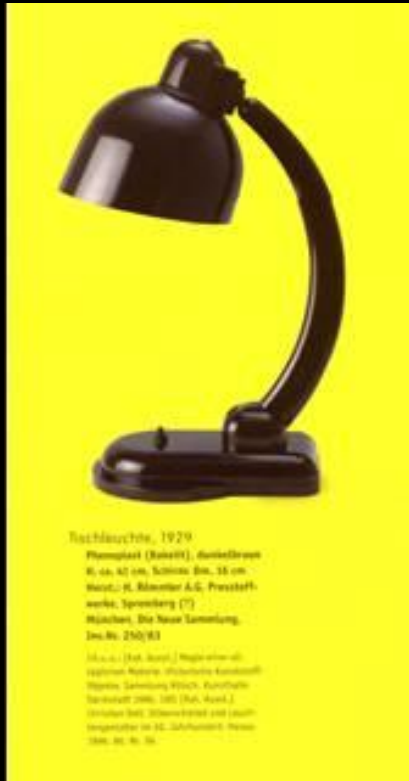


Emile Gallé  
1846\_1904



Emile Gallé  
1846\_1904

Bakelit, 1929



Christian Dell, 1929. Bauhaus |  
Bakelit, 1929



Walter Dorwin Teague  
Nº114  
Bakelit  
1939

Walter Dorwin Teague  
Nº114  
Bakelit  
1939

Massimo Vignelli  
Modelo nº 40351  
1954



Massimo Vignelli  
Modelo nº 40351  
1954

Paul Henningsen  
Modelo nº ph3+  
1956



Paul Henningsen  
Modelo nº ph3/4  
1956



Paul Henningsen  
Modelo nº ph5  
1958

Isamu Noguchi  
Candeeiros Akari - papel  
1960



Isamu Noguchi  
Candeeiros Akari - papel  
1960

Gruppo Architetti Urbanisti Città Nuova  
Nesso  
1962



Gruppo Architetti Urbanisti Città Nuova  
Nesso  
1962



Joe & Gianni Colombo  
Acrylica  
1962



A white, sculptural lamp with a flower-like shape, featuring a dark, circular opening in the center. The lamp is illuminated from within, casting a warm glow. It is set against a dark background.

Vico Magistretti  
Tischleuchte v. Teagoneon,  
1966  
ABS-Kunststoff, rot bzw. weiß  
Polymereisen, weiß  
H. 40 cm, B. 24,4 cm, T. max. 24 cm  
Nent.-Artemide S.p.A., Peregno

Obj. u. v. 200. Markt 2. System. Dritte  
Glasgow-Ausstellung, Paris 1980. 200. Markt  
Nent. und Reprodukt. Design. Berlin

Vico Magistretti  
"telegono"  
1968

**Neo Magazine II**  
**"Telepono"**  
**1968**

Ennio Lucini  
"Cespuglio di Gino"  
1968



Ennio Lucini  
"Cespuglio di Gino"  
1968



Vico Magistretti  
"Mezzachimera"  
1969/70

to Magistretti  
"Mezzachimera"  
1970



Livio Castiglioni e Gianfranco Frattini  
Boalum  
1969/70

Richard Sapper  
Tizio  
1972



Richard Sapper  
Tizio  
1972



Gijs Bakker  
Paraplulamp  
1973

Gijs Bakker  
Paraplulamp  
1973



Masayuki Kurokawa  
Cobra  
1973

Martine Bedin  
Super-Memphis  
1981



Martine Bedin  
Super-Memphis  
1981





Shigeru Uchida  
Tenderly  
1985



Alberto Meda e Paolo Rizzato  
Titania  
1989

Alberto Meda e Paolo Rizzato  
Titania  
1989

Telo Army  
Hanging Lamp  
1991



Tejo Remy  
Hanging lamp  
1991

Ross Lovegrove  
Luceplan – Solar bud Lamps  
1997



Ross Lovegrove  
Luceplan – Solar bud Lamps  
1997



Ross Lovegrove  
Luceplan – Pod Lens  
1997

Ross Lovegrove  
Luceplan – Pod  
1997

Ingo Maurer, Dagmar Mombach  
Table lamp Samurai  
1998



Ingo Maurer, Dagmar Mombach  
Table lamp Samurai – Homage to Issey Miyake  
1998

Emili Padrós  
Non stop shoes -Barcelona  
1999



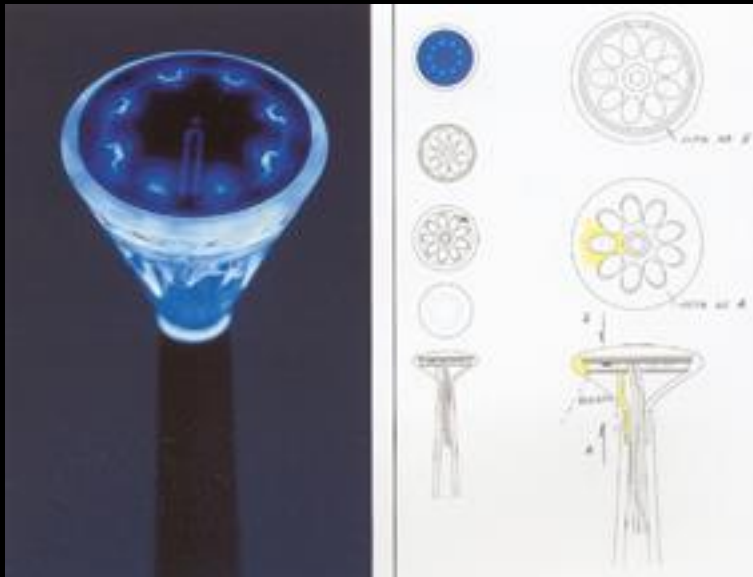
Emili Padrós  
Non stop shoes -Barcelona  
1999

Heiko Hansen  
Oggetto Luminoso interattivo\_luz+sofá  
Optiball  
1999



Heiko Hansen  
Oggetto Luminoso interattivo\_luz+sofá  
Optiball  
1999

Alberto Meda, Paolo Rizzatto  
Candela Infinita\_ Luceplan  
1999



Alberto Meda, Paolo Rizzatto  
Candela Infinita\_ Luceplan  
1999



Art Center College of Design of Pasadena  
 Globo luminoso\_ Fotoluminescente  
 Tactility  
 2000



Art Center College of Design of Pasadena  
 Globo luminoso\_ Fotoluminescente  
 Tactility  
 2000

Almaduna Royo Velasco, Ivan Martin Gomez e Sara Martin Toledo  
 "lumo" – Almudena\_ Fotoluminescente  
 1999



Almaduna Royo Velasco, Ivan Martin Gomez e Sara Martin Toledo  
 "lumo" – Almudena\_ Fotoluminescente  
 1999

Winfried Scheuers  
LiteLite  
1997



Winfried Scheuers  
LiteLite  
1997

Cristopher Wright  
2.5 D Lamp  
2002



Cristopher Wrights  
2.5 D Lamp  
2002

# results f

After this research what kind of  
light you want to design?

A lamp, a table lamp, a complex  
light system, a light kit for kids  
with cancer or public space light  
spot?



Our students and experiments with 2d and 3d light structures and paper and recycled plastic



2d to 3d light structures



prototype with paper students house



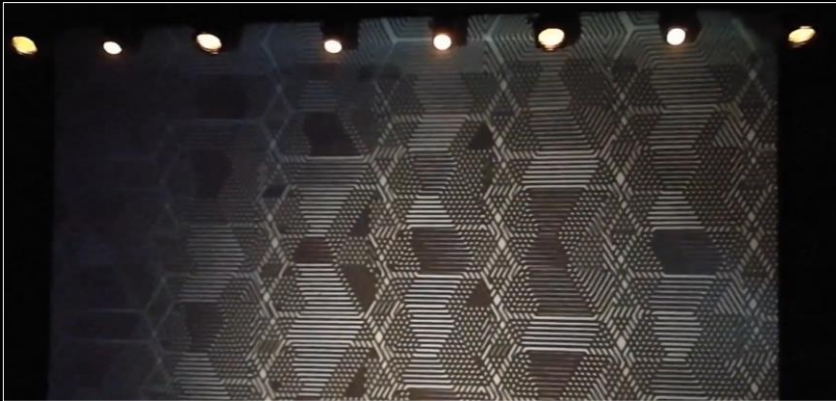


project design and do-it-your(sel)er light project.  
second use for packaging ...Objects and light make a second intersection and  
interaction in greendesign extension program. Processes, attitudes, ideas and  
concepts before forms [pre-forms].  
We send one s.o.s. to the world...[sting]...

#### **Peregrination of light**

Music from Boards of Canada | **Music is Math**

[https://www.youtube.com/watch?v=F7bKe\\_Zgk4o](https://www.youtube.com/watch?v=F7bKe_Zgk4o)



Playing with sounds (make|make) and  
analogic animation through optical art  
repetition patterns.... [Light and movement](#)



**Still missing a few  
steps to translate**