



Journée internationale
de la lumière

16 mai

La couleur des lasers Introduction

Valentine Gaudillat

16/05/2022

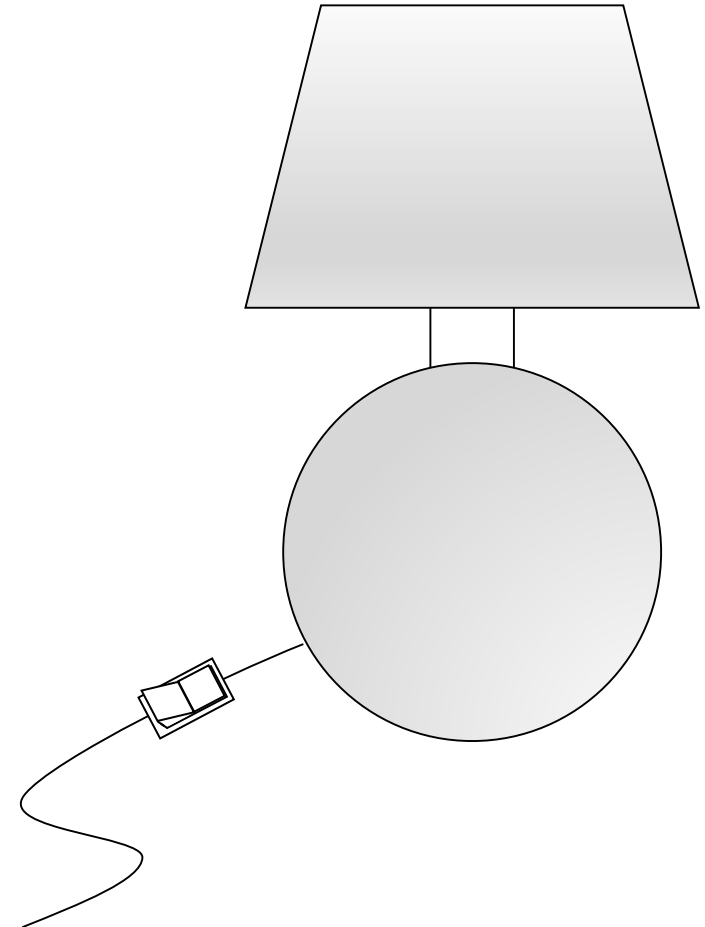
Le laser !

Laser : lumière très puissante sur une petite surface !

Le laser !

Laser : lumière très puissante sur une petite surface !

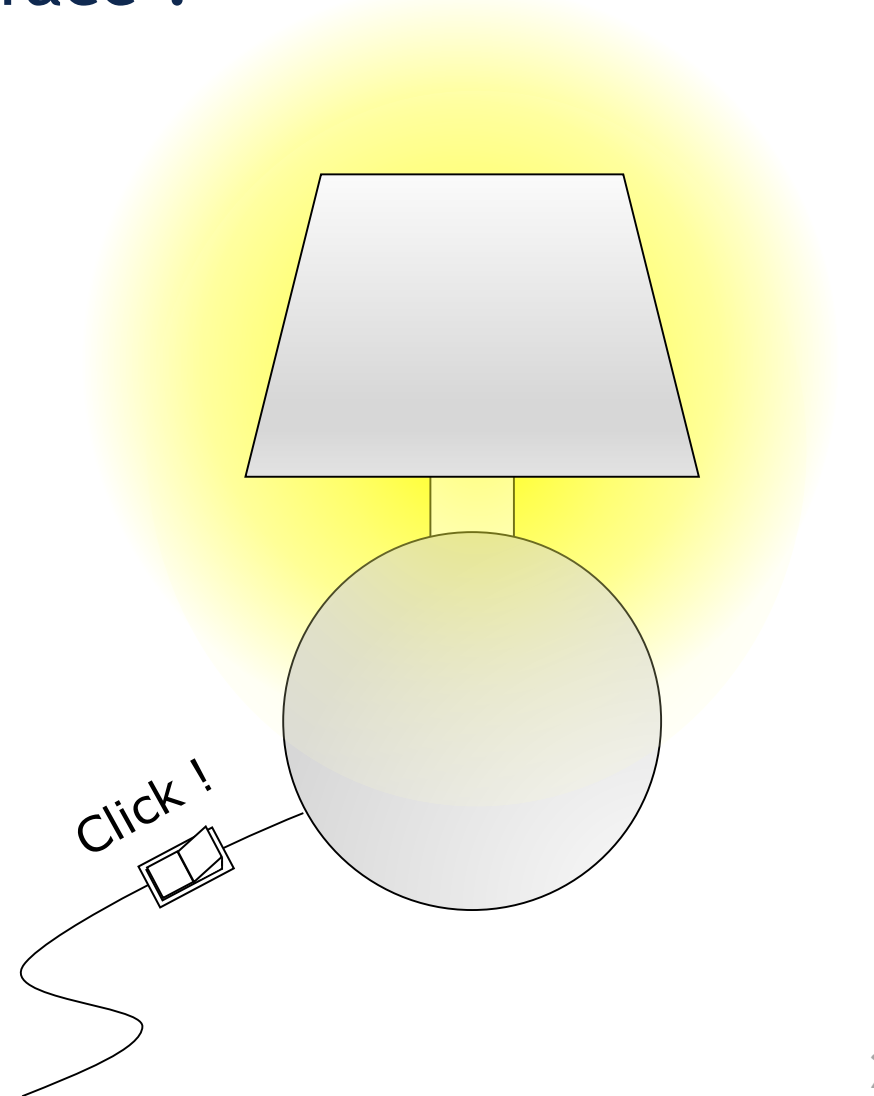
Lampe : lumière sur une grande surface



Le laser !

Laser : lumière très puissante sur une petite surface !

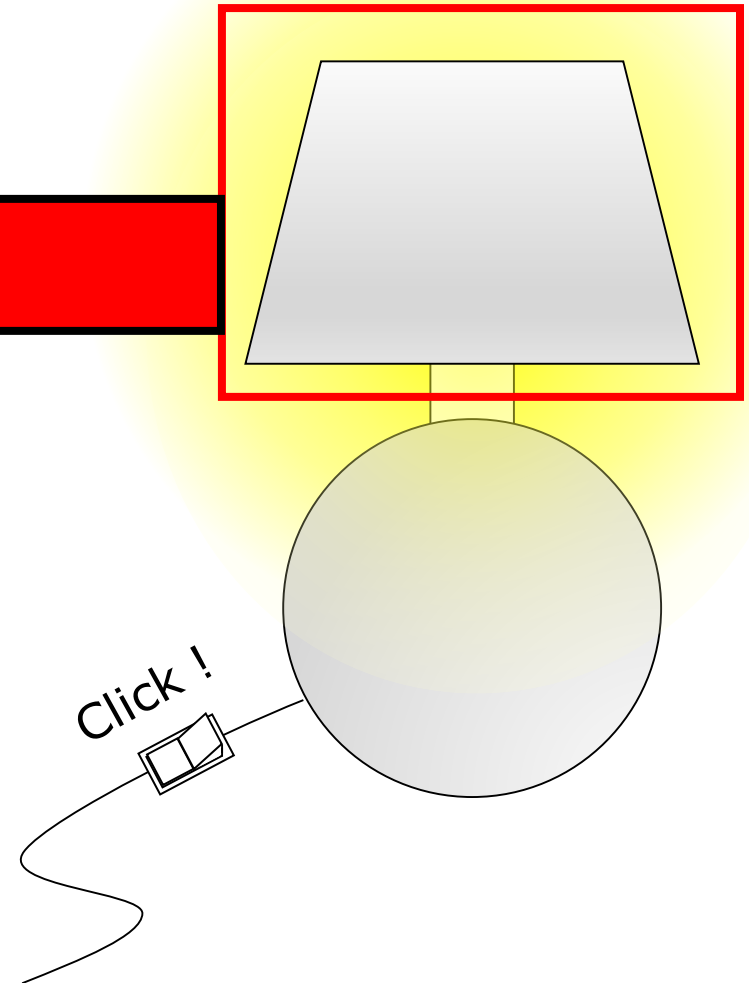
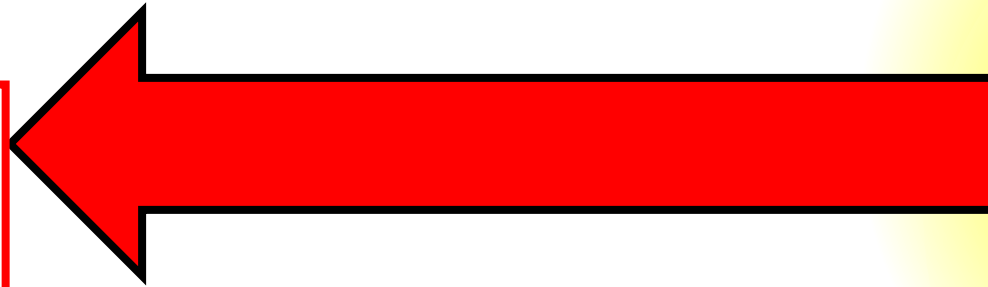
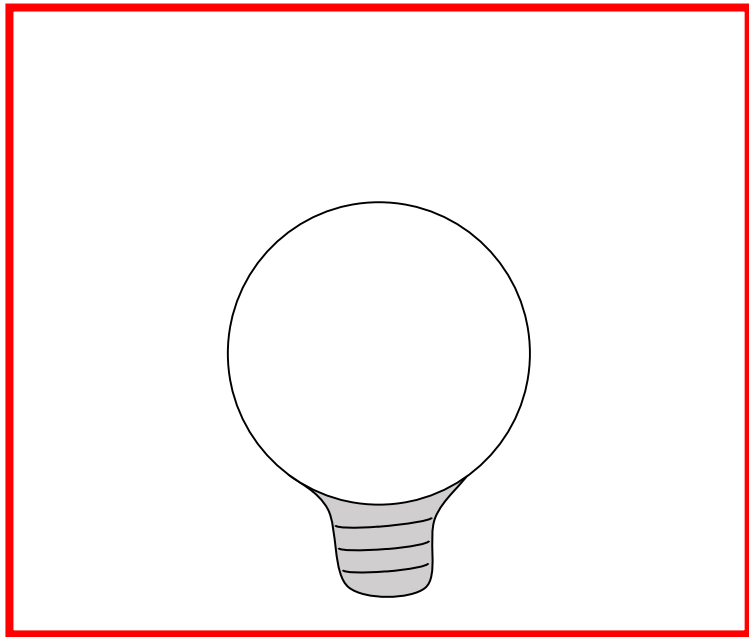
Lampe : lumière sur une grande surface



Le laser !

Laser : lumière très puissante sur une petite surface !

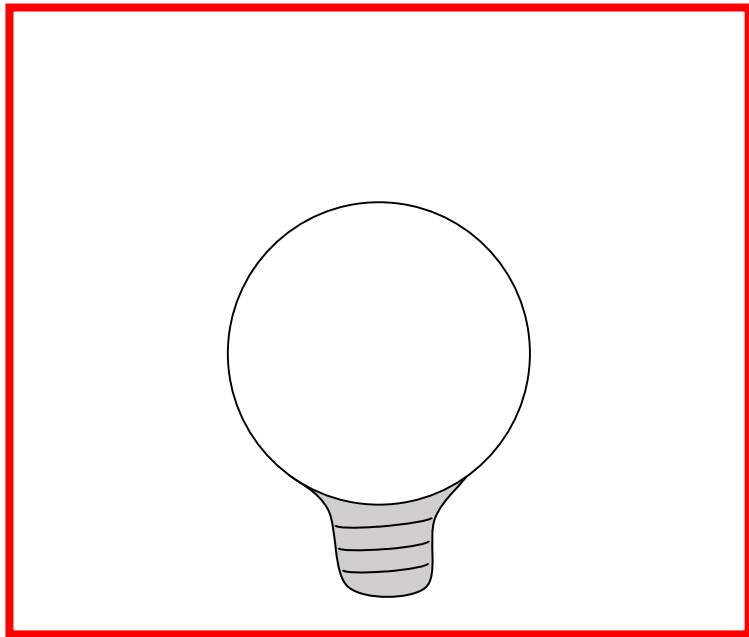
Lampe : lumière sur une grande surface



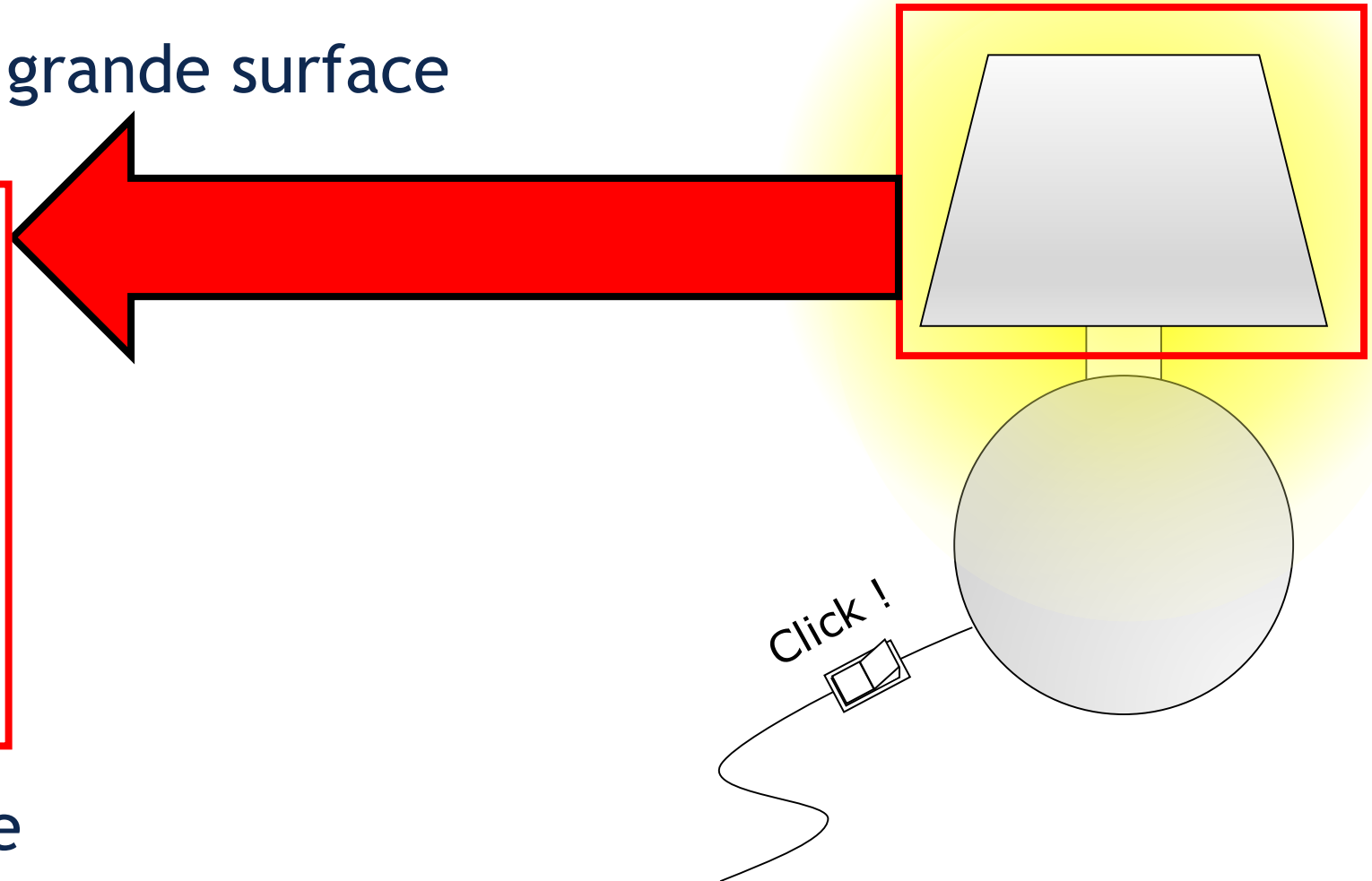
Le laser !

Laser : lumière très puissante sur une petite surface !

Lampe : lumière sur une grande surface



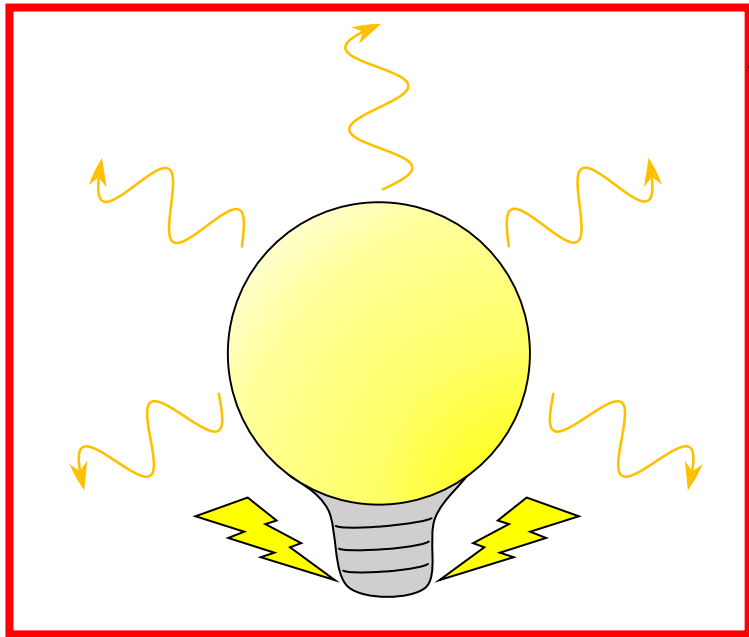
Electricité → Lumière



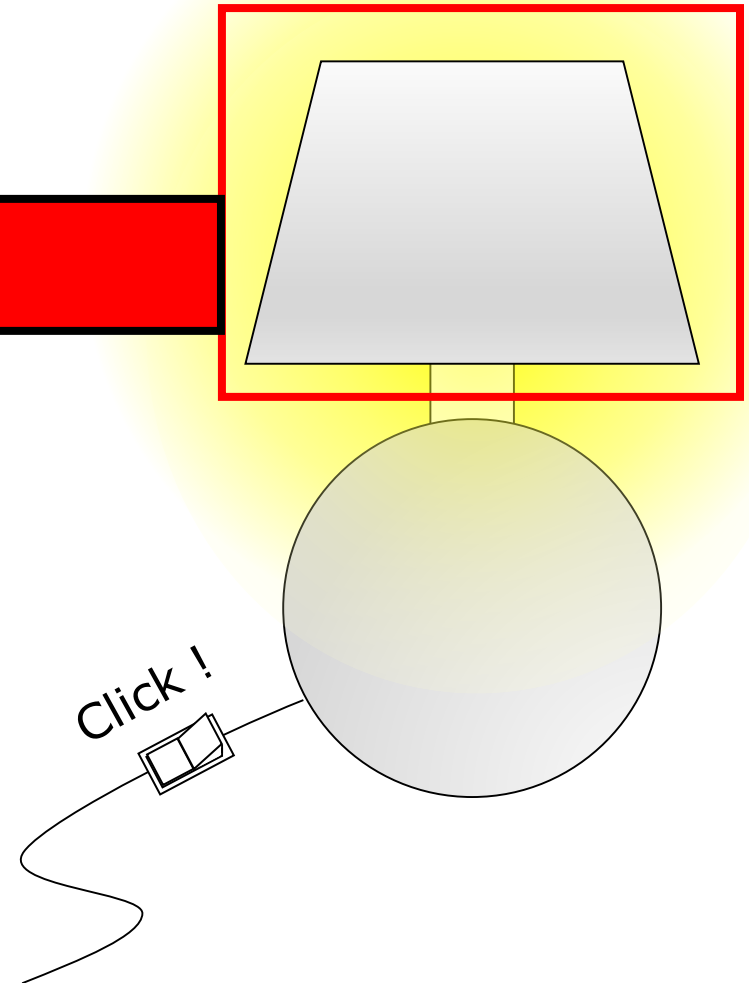
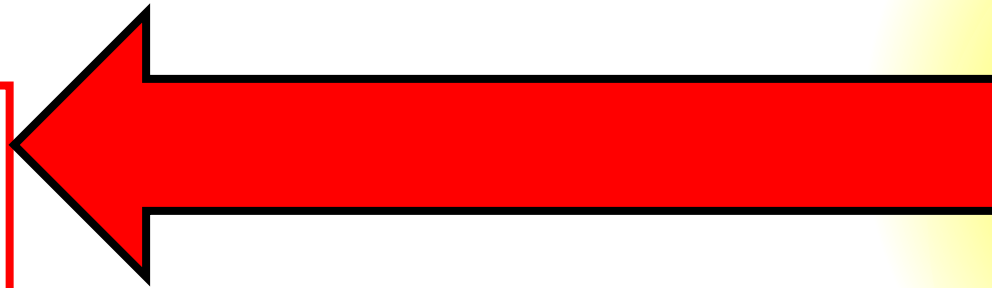
Le laser !

Laser : lumière très puissante sur une petite surface !

Lampe : lumière sur une grande surface

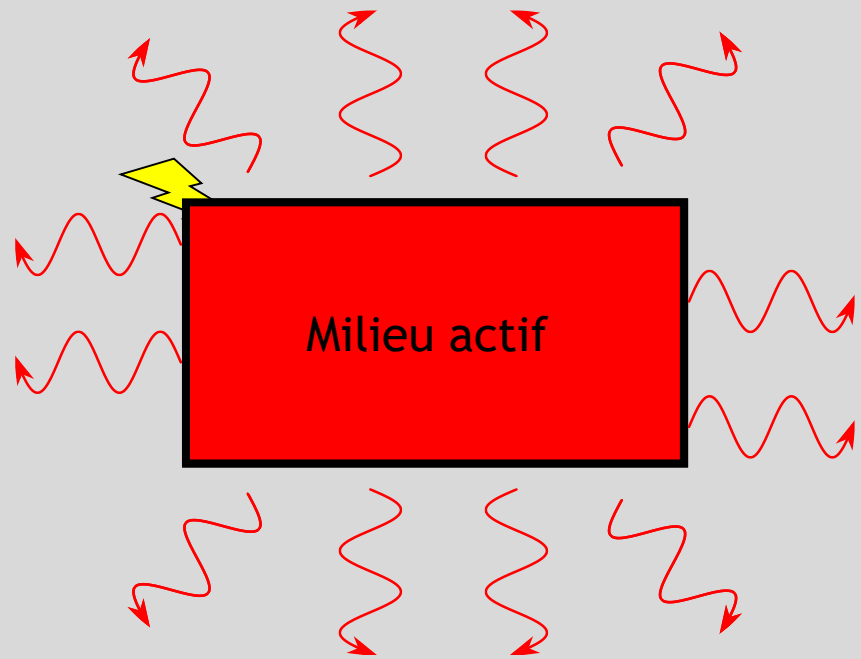


Electricité → Lumière

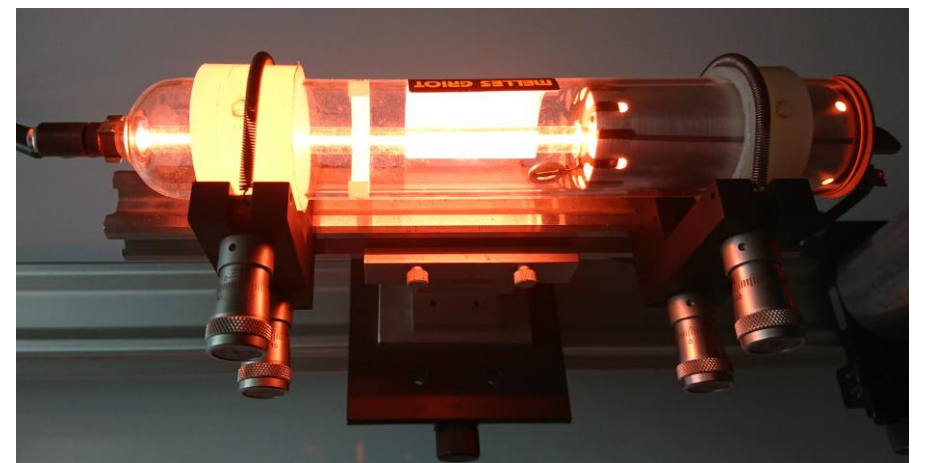
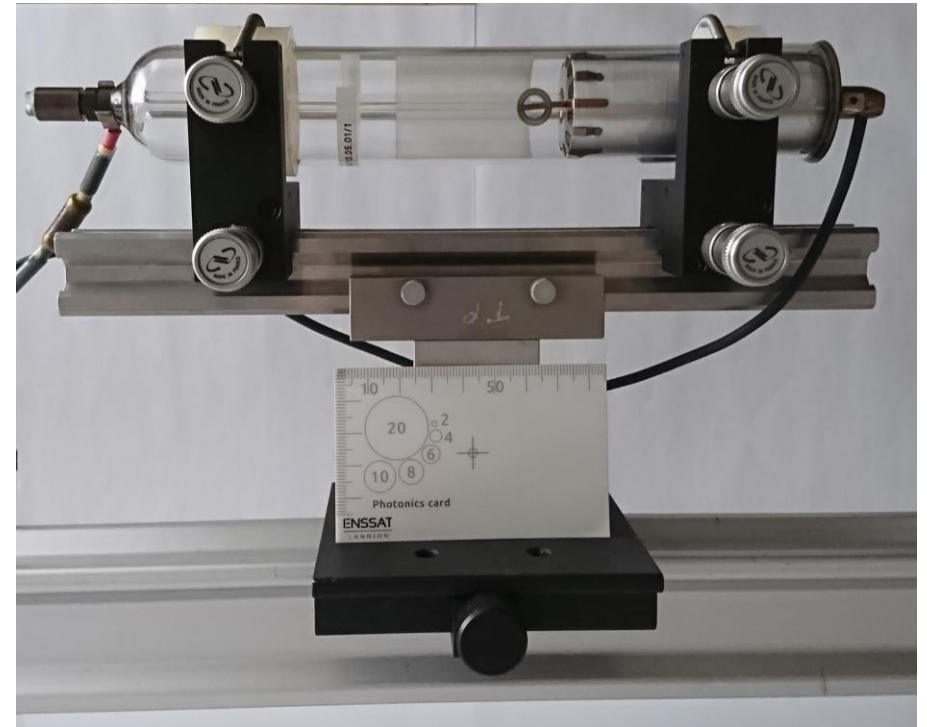


Le laser !

Laser : « milieu actif »

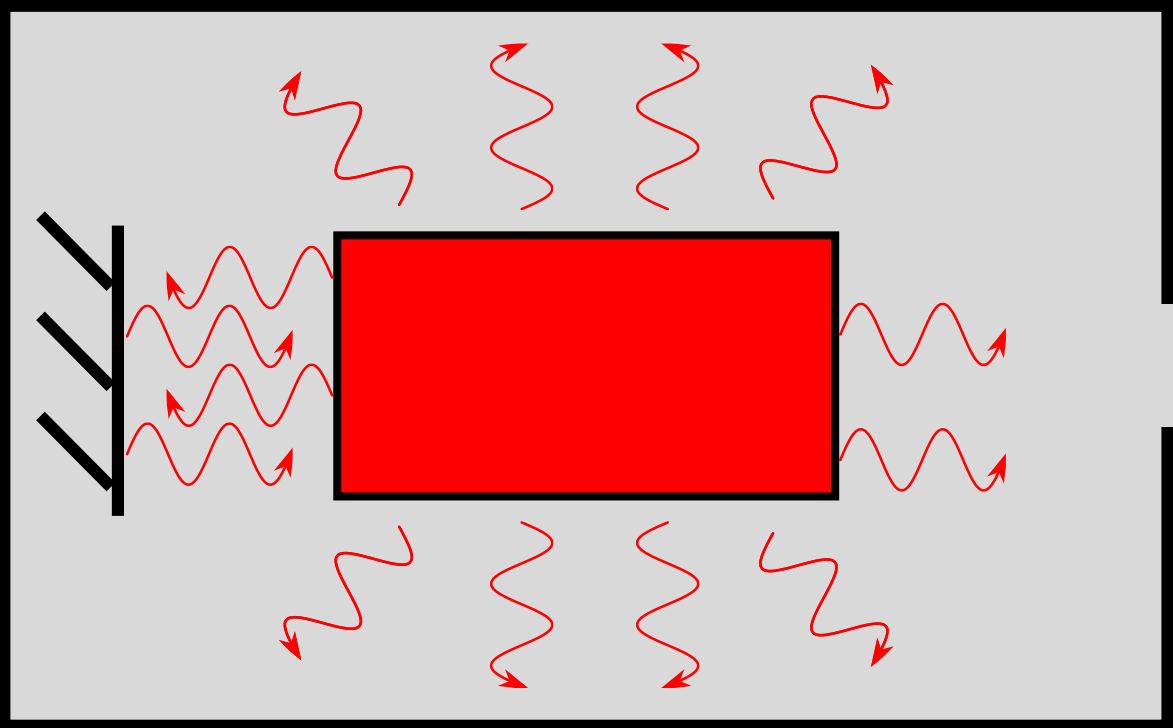


Energie

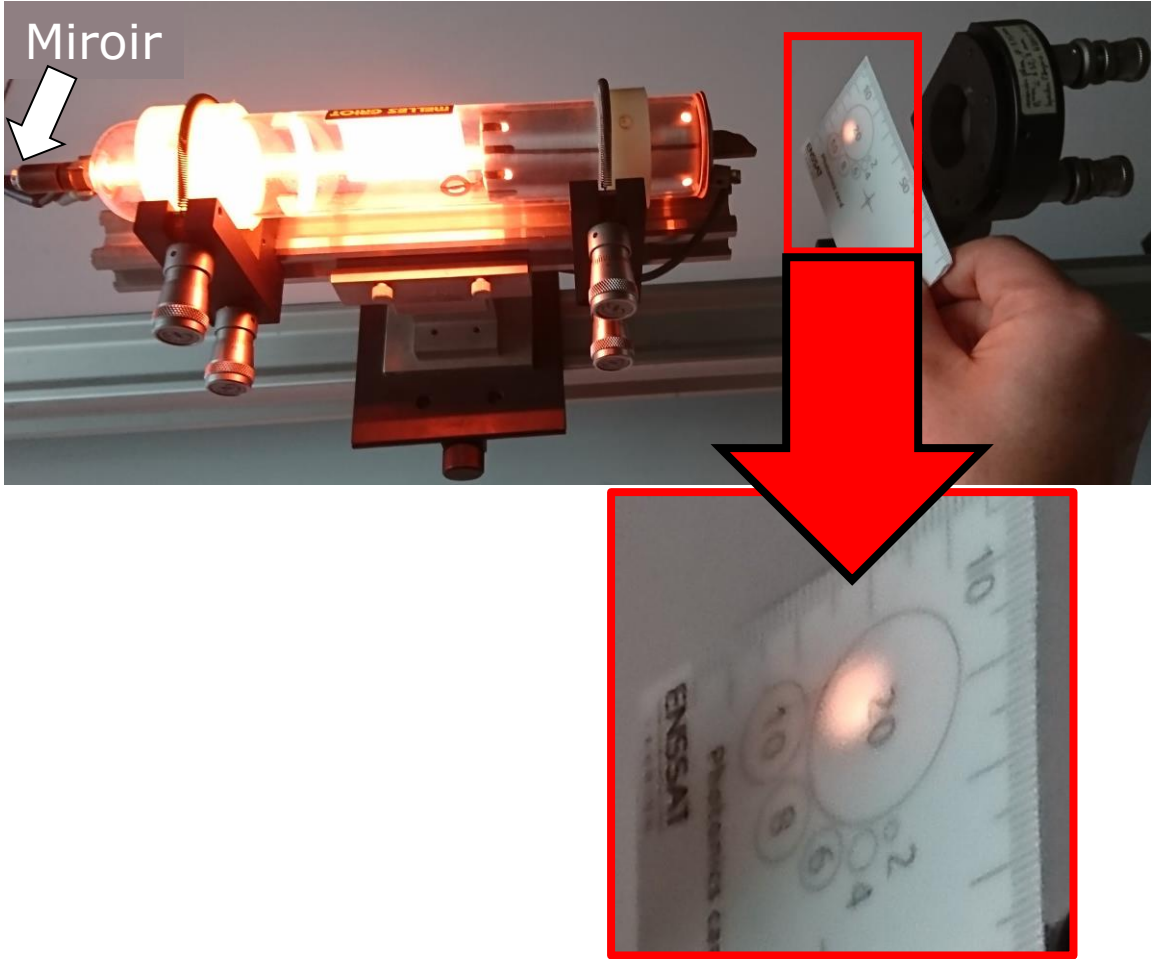


Le laser !

Laser : « milieu actif »

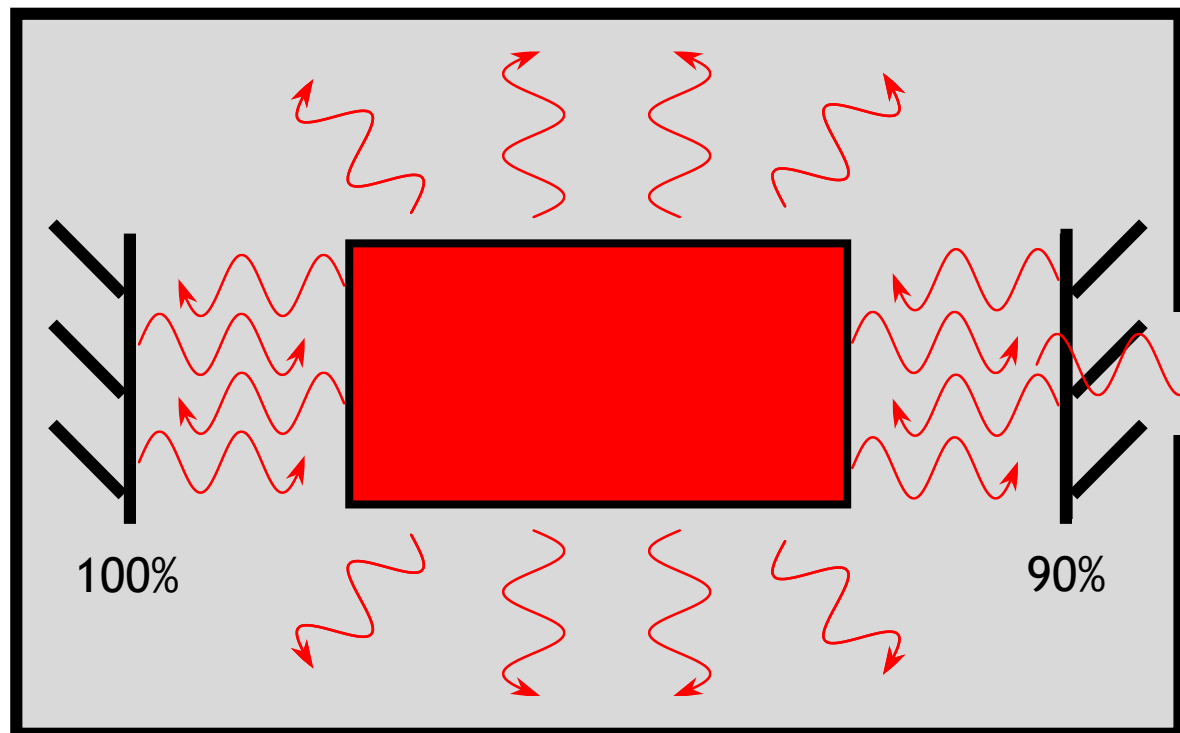


Energie → Lumière

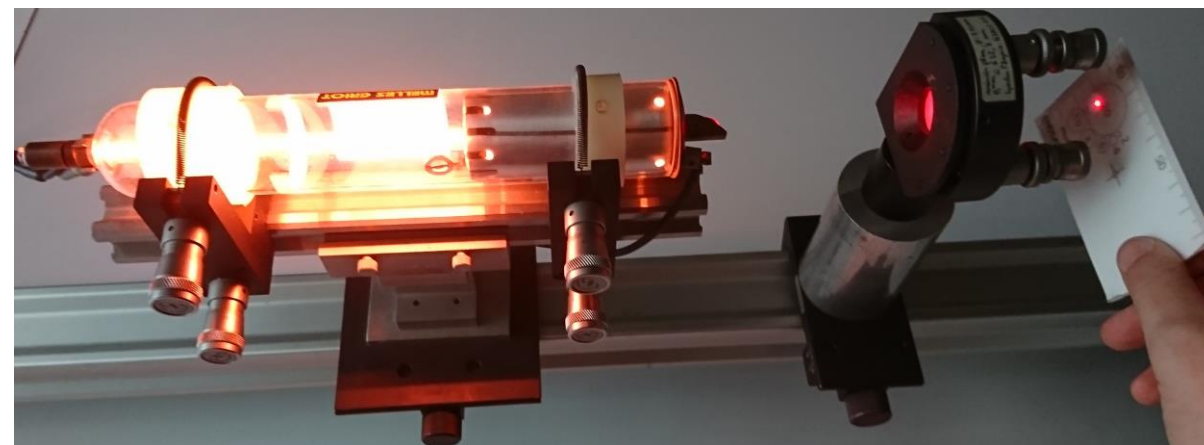
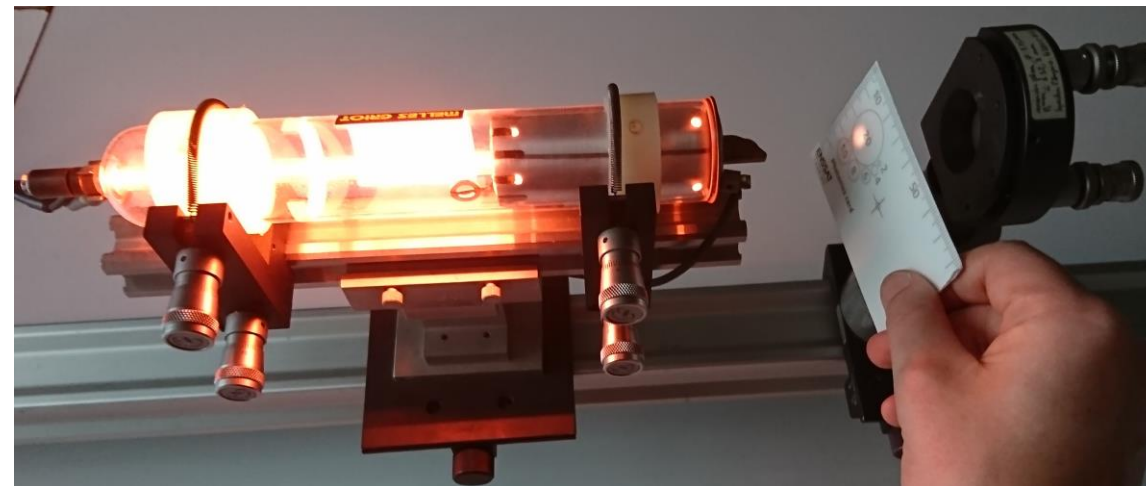


Le laser !

Laser : « milieu actif » + cavité (deux miroirs)



Energie → Lumière

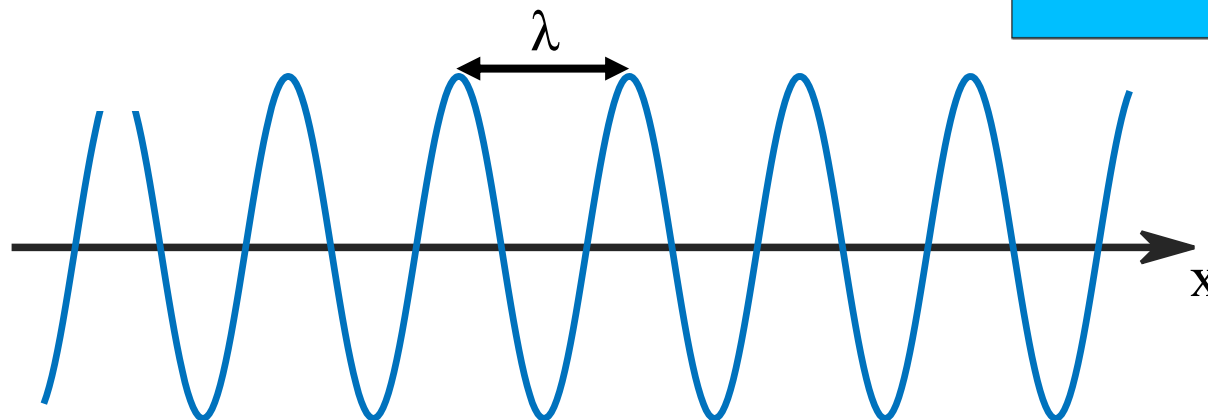
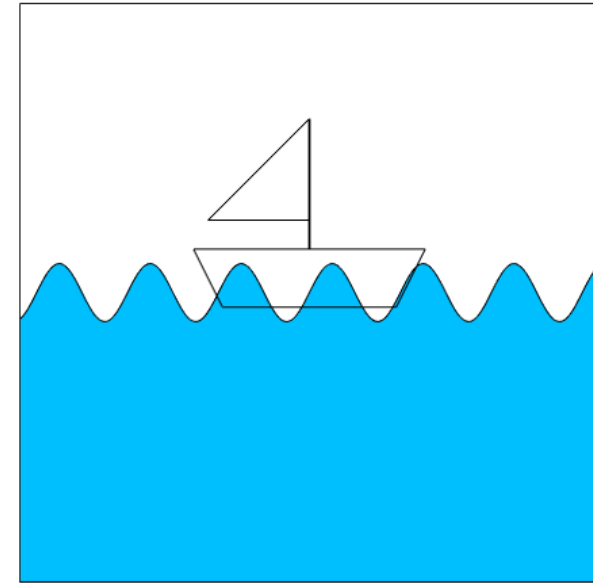
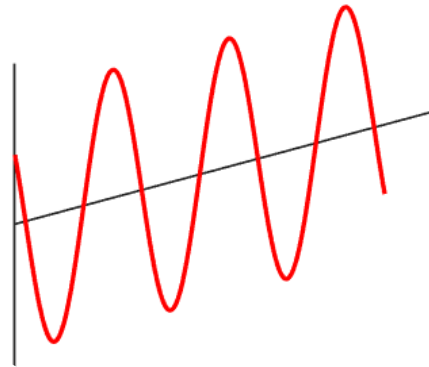
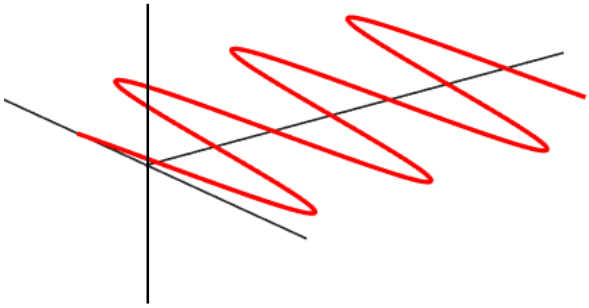


La lumière : une onde

Lumière →  ?

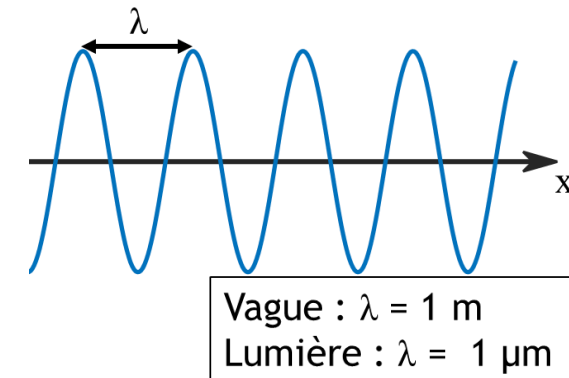
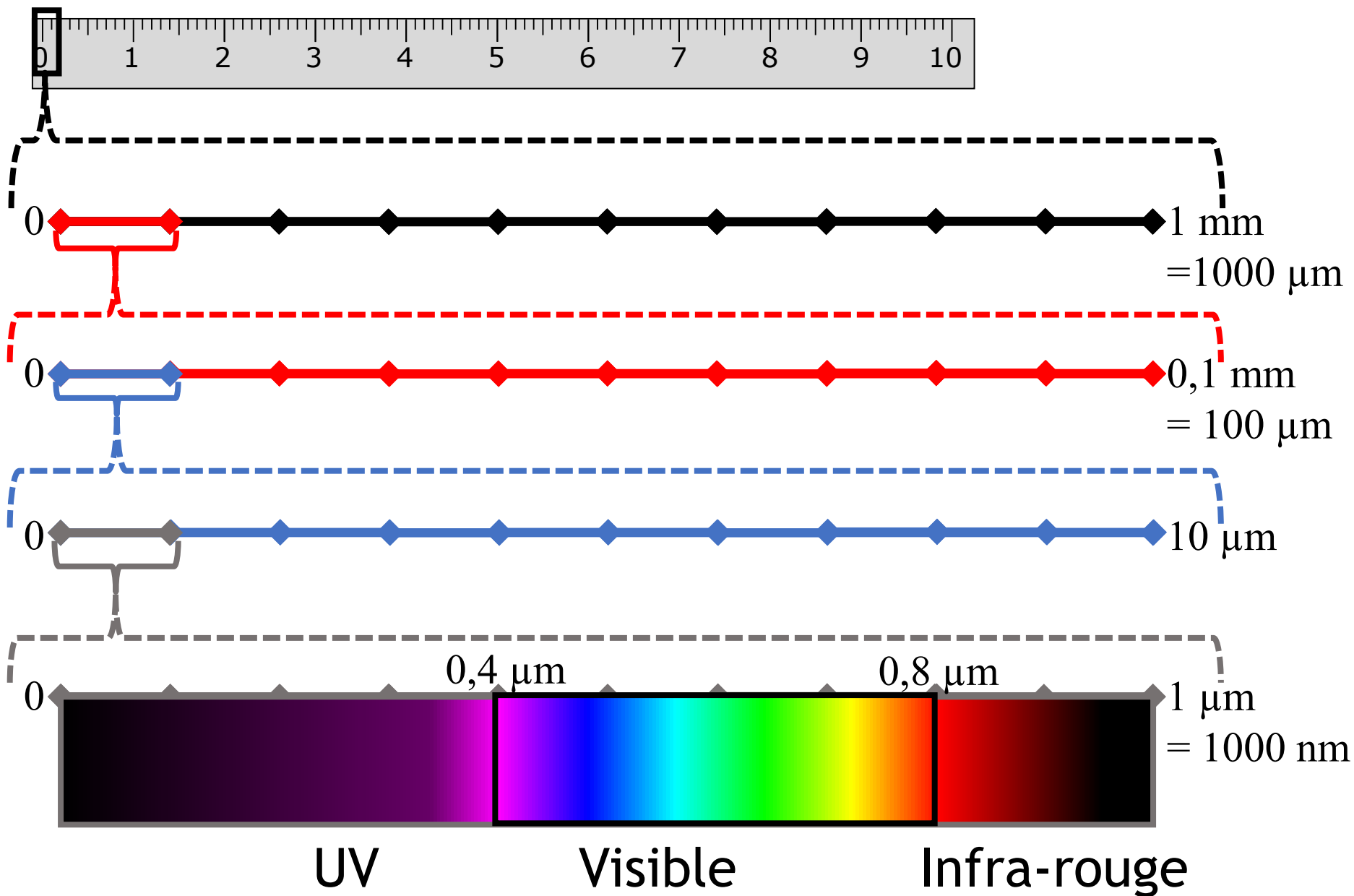
Autre onde, les vagues !

→ Onde sur la surface 2D



Vague : $\lambda = 1 \text{ m}$
Lumière : $\lambda = 1 \mu\text{m}$

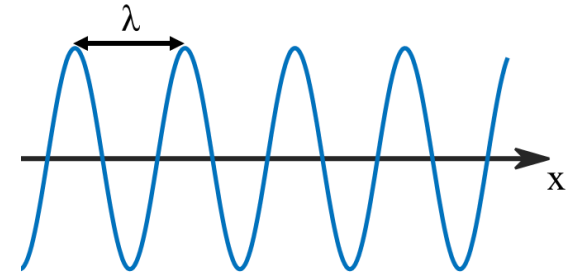
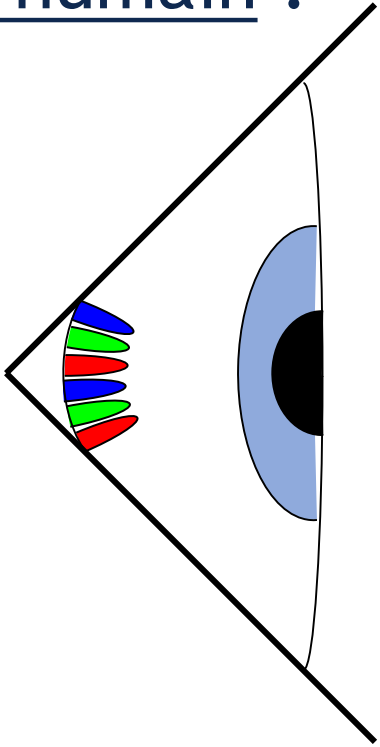
La couleur



Pour le nanomètre,
c'est pareil !
 $1 \mu\text{m} = 1000 \text{ nm}$

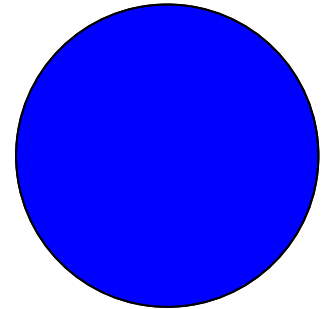
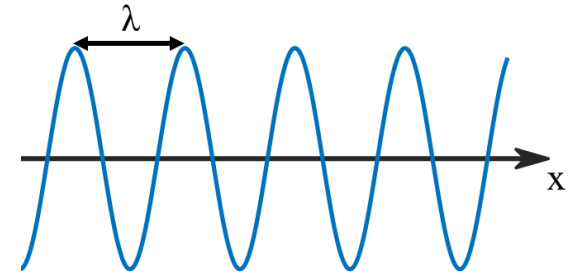
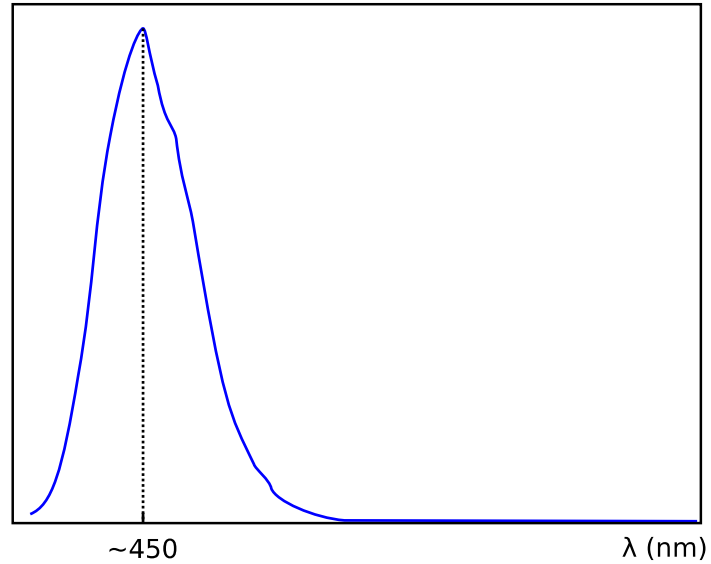
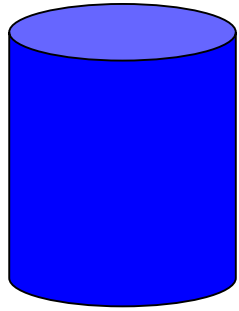
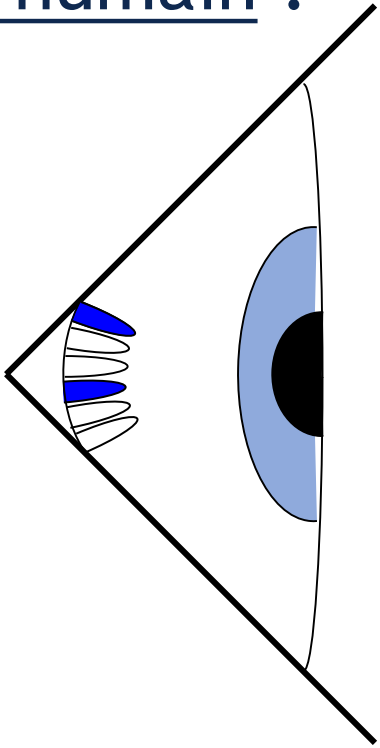
La couleur

Œil humain :



La couleur

Œil humain :

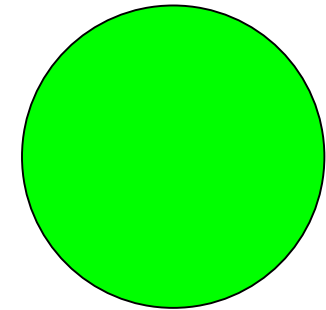
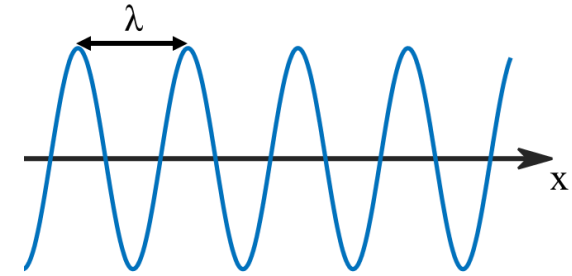
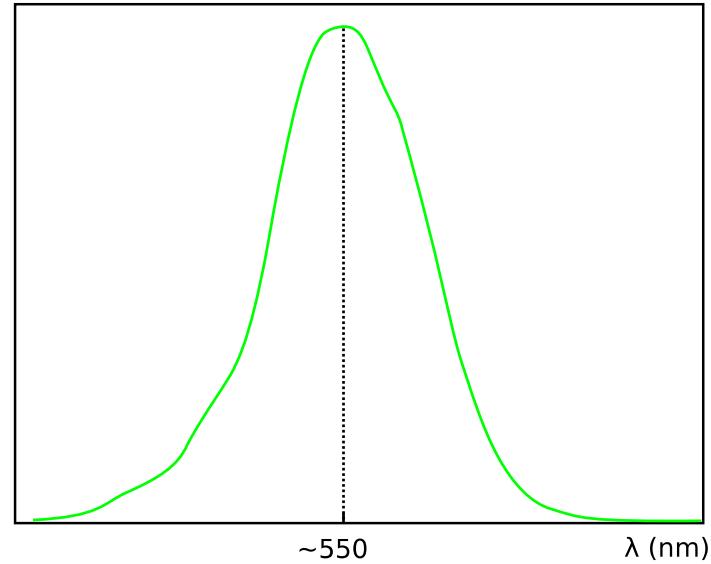
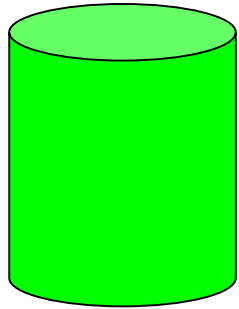
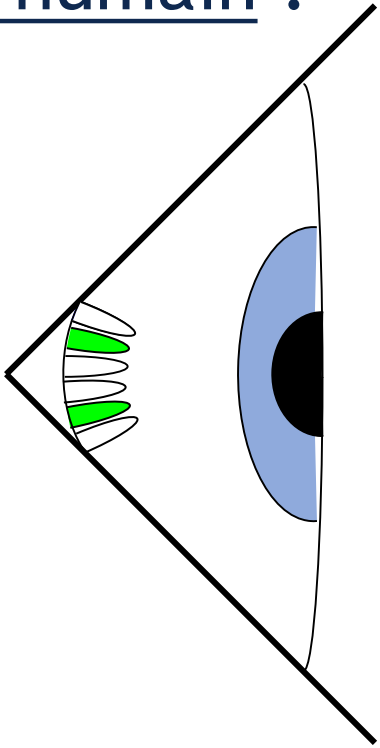


3 cônes :

- Bleu
- Vert
- Rouge

La couleur

Œil humain :

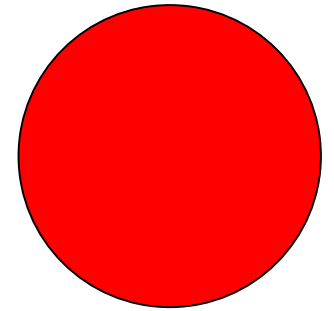
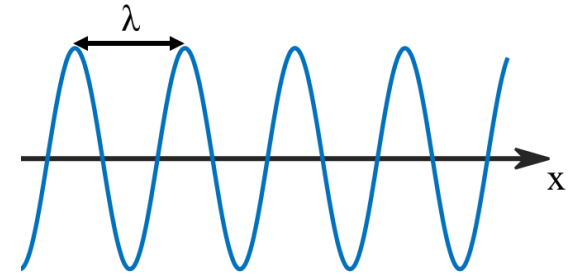
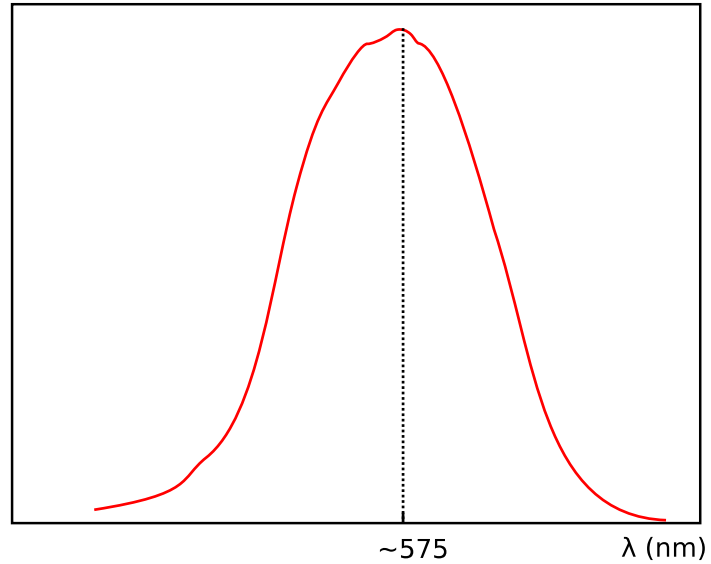
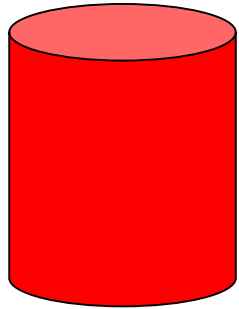
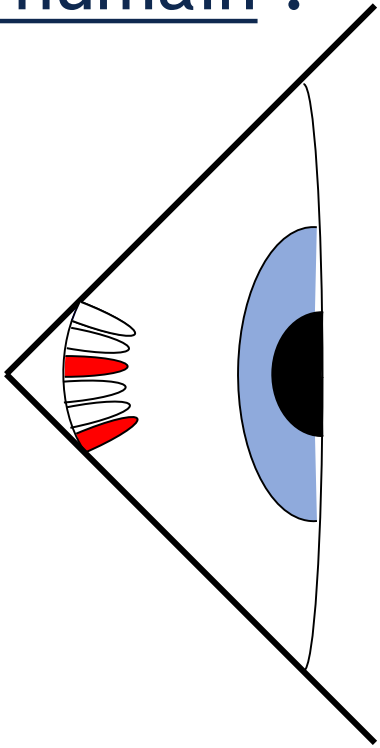


3 cônes :

- Bleu
- Vert
- Rouge

La couleur

Œil humain :

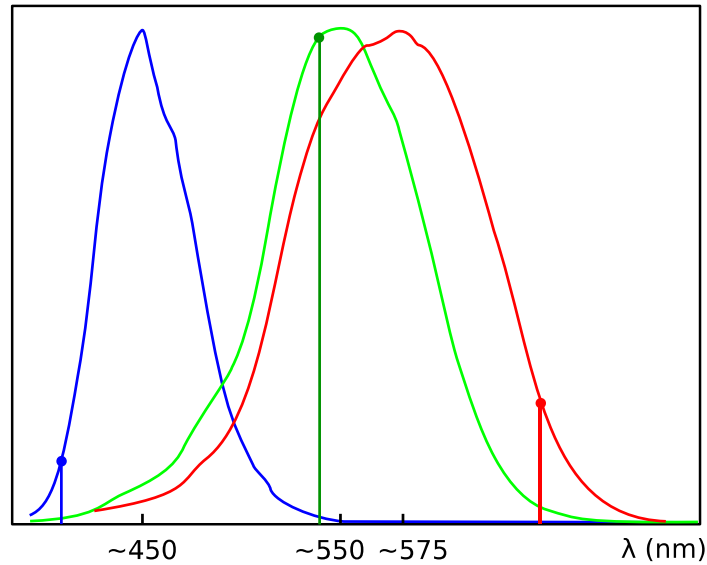
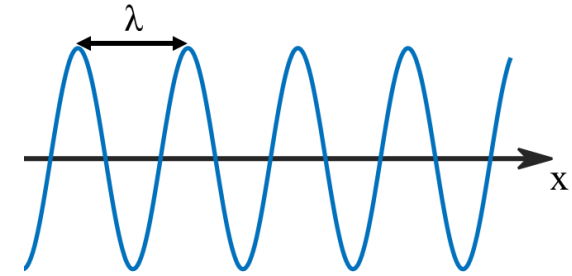
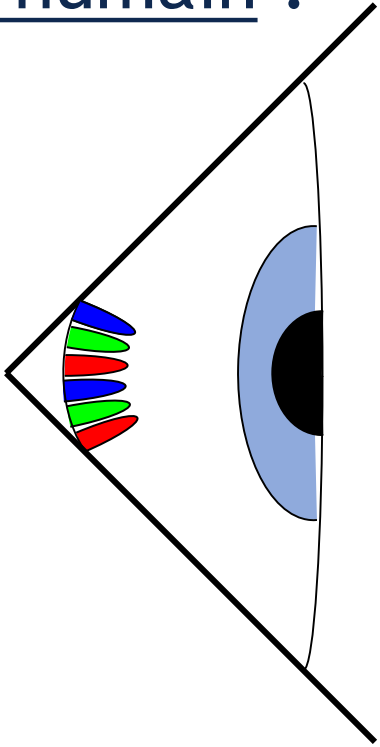


3 cônes :

- Bleu
- Vert
- Rouge

La couleur

Œil humain :

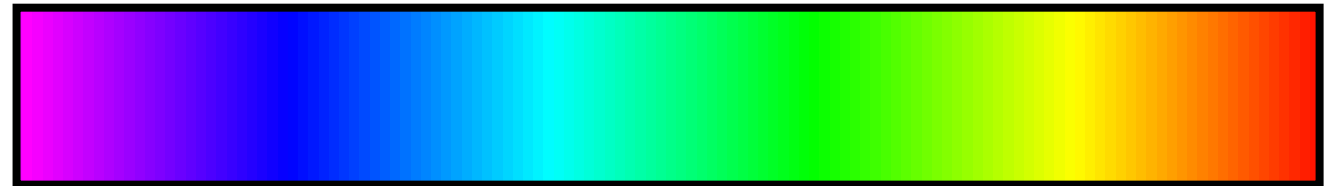


3 cônes :

- Bleu
- Vert
- Rouge

$0,4 \mu\text{m} = 400 \text{ nm}$

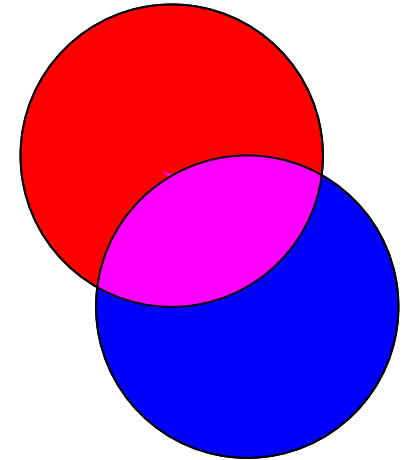
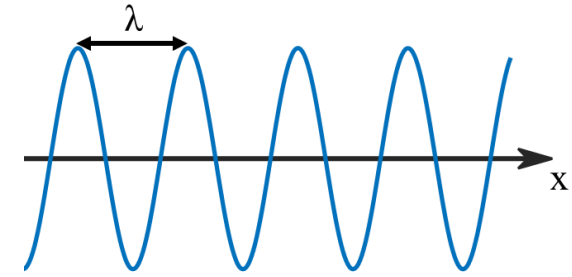
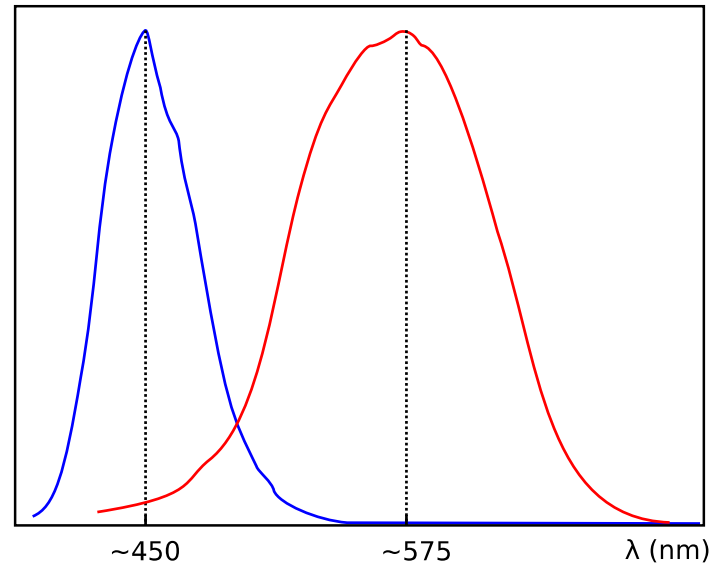
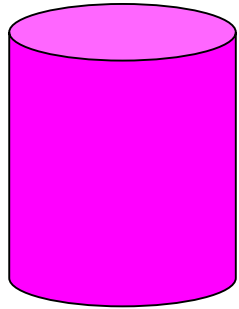
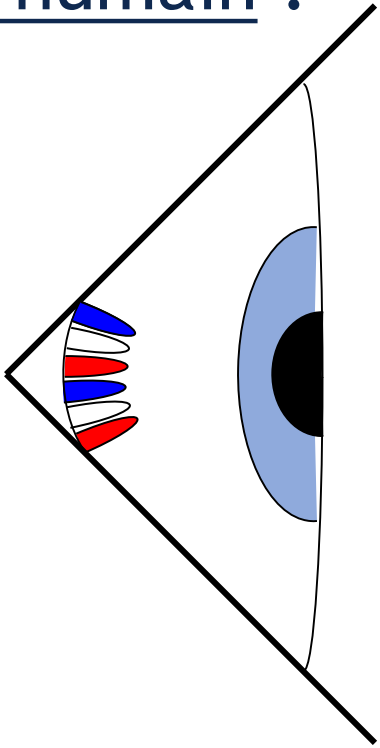
$0,8 \mu\text{m} = 800 \text{ nm}$



Visible

La couleur

Œil humain :

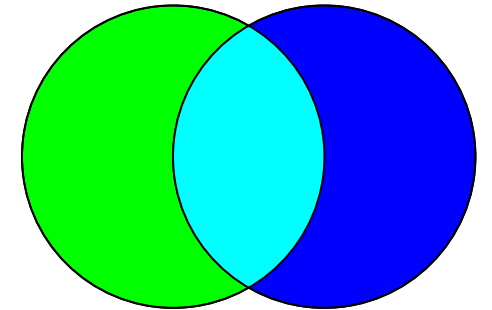
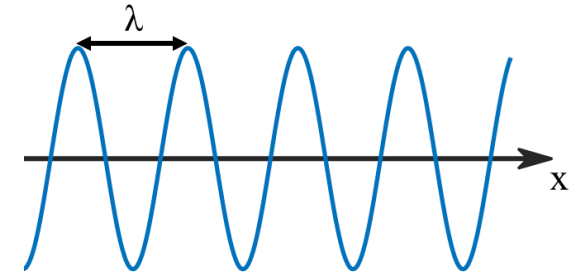
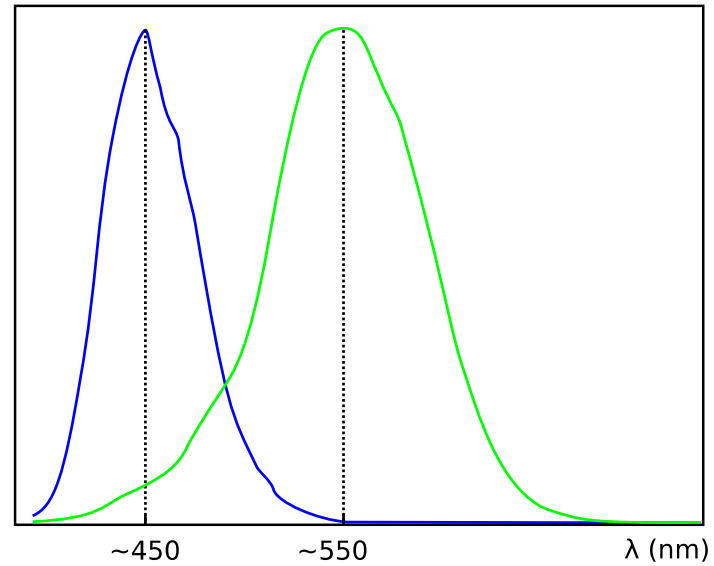
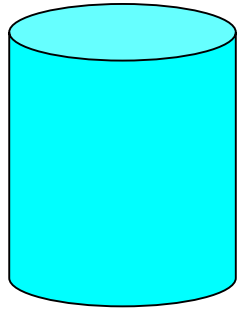
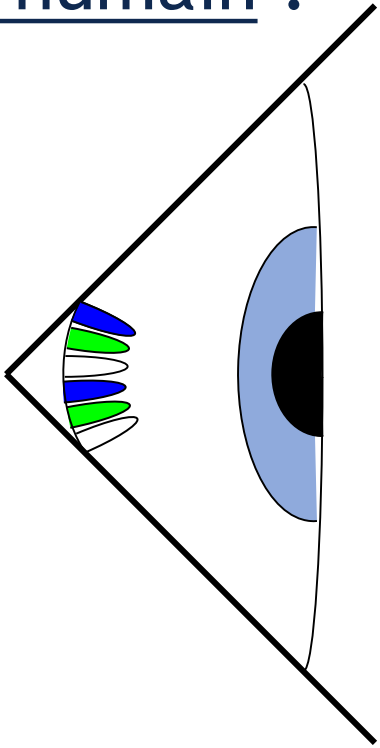


3 cônes :

- Bleu
- Vert
- Rouge

La couleur

Œil humain :

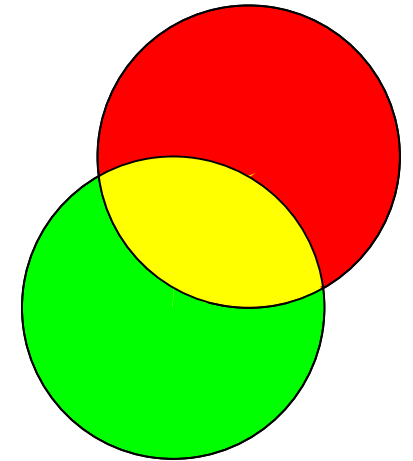
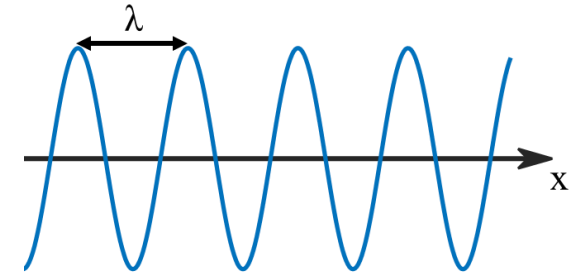
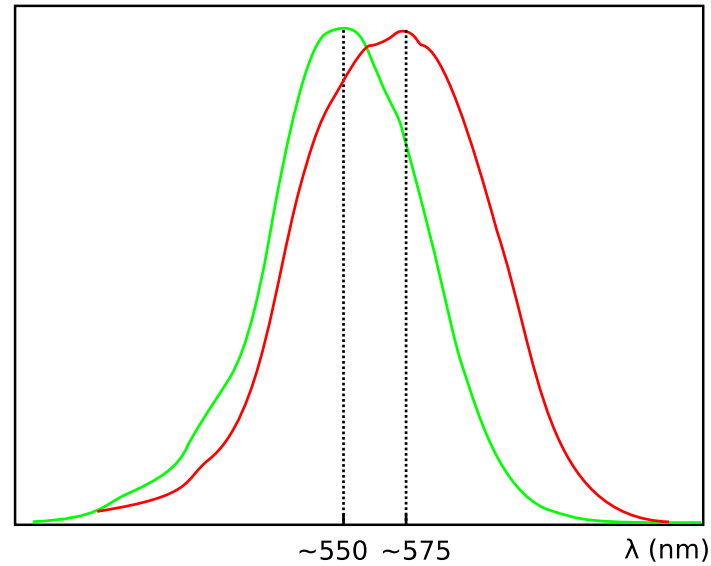
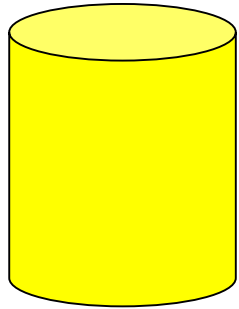
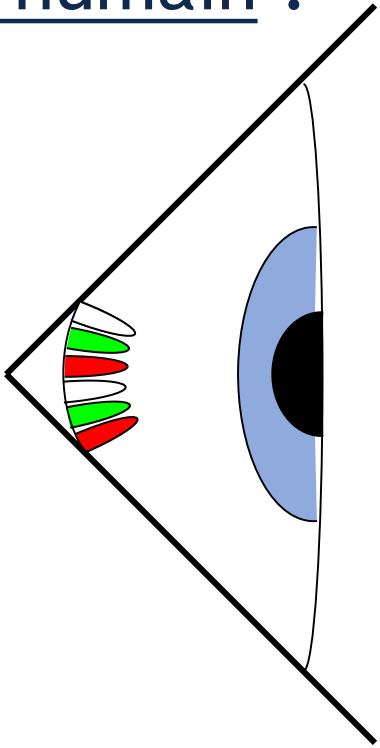


3 cônes :

- Bleu
- Vert
- Rouge

La couleur

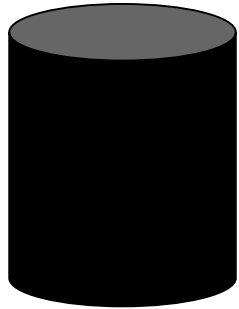
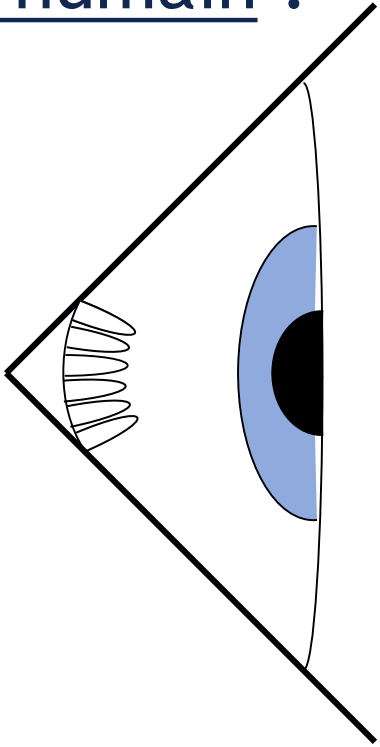
Œil humain :



3 cônes :

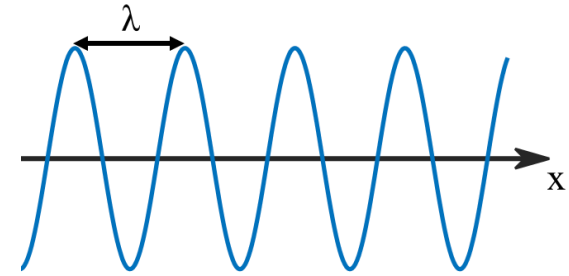
- Bleu
- Vert
- Rouge

Œil humain :



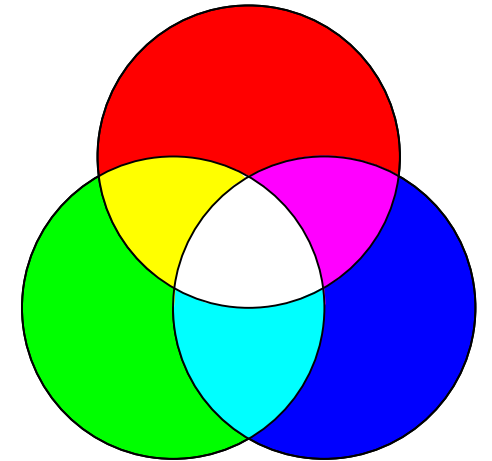
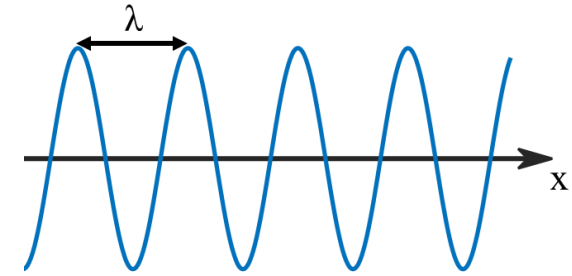
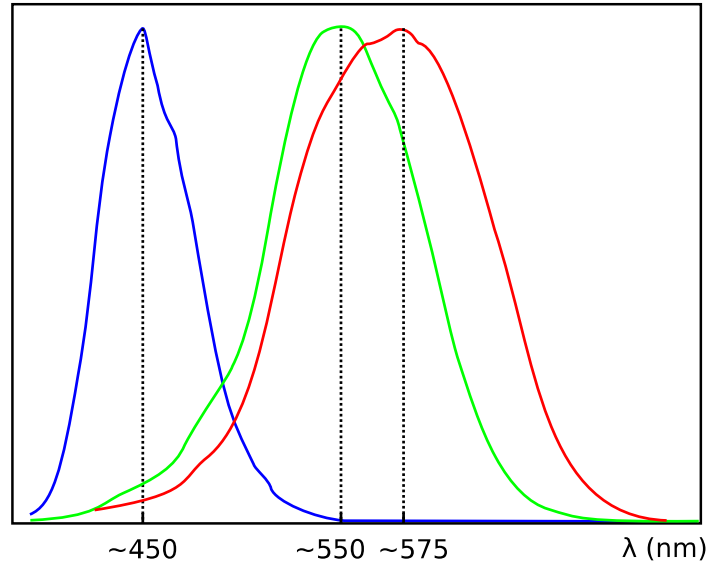
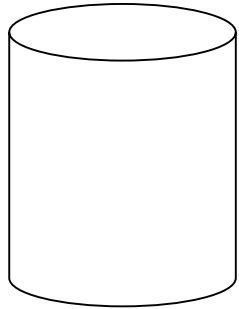
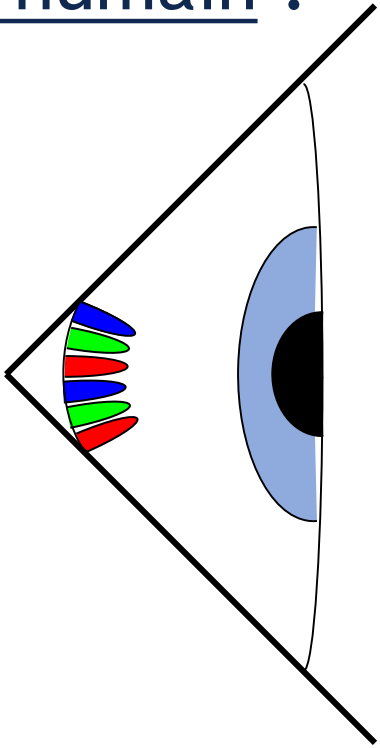
3 cônes :

- Bleu
- Vert
- Rouge



La couleur

Œil humain :

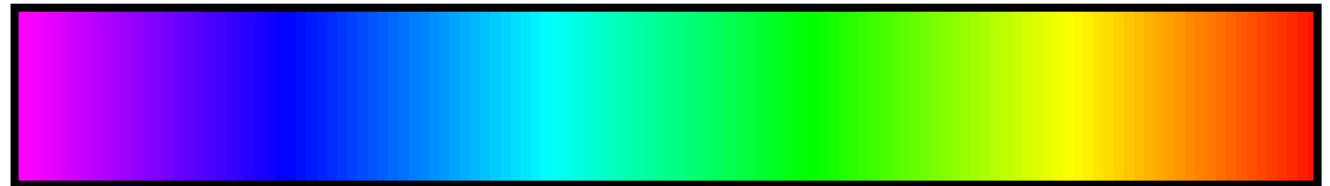


3 cônes :

- Bleu
- Vert
- Rouge

0,4 μm = 400 nm

0,8 μm = 800 nm



Visible