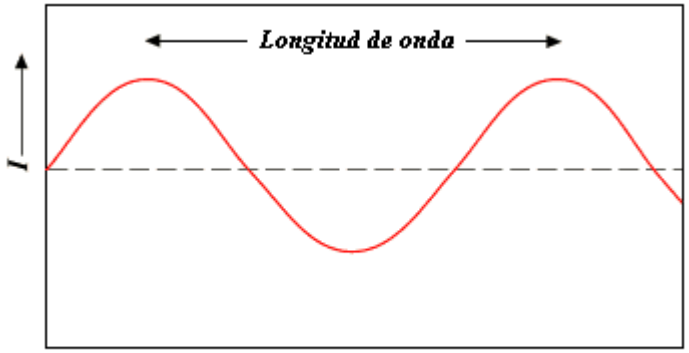
La luz, el color y la luminiscencia

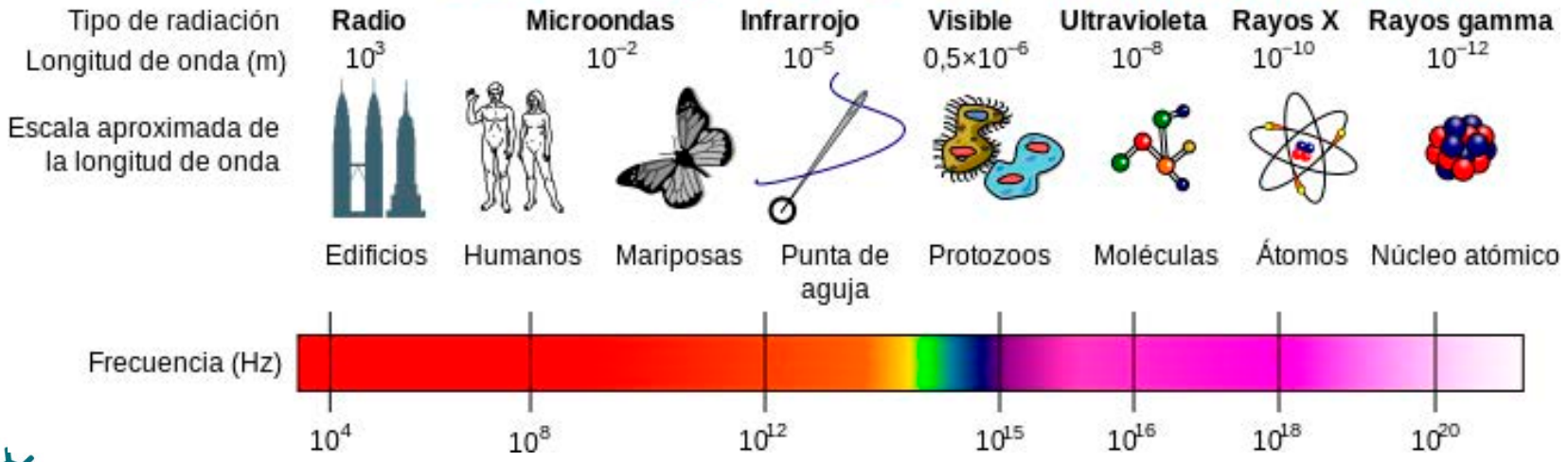
Fernando Bozoglian
Unitat d'Espectroscopia i cinétiques
Institut Català d'Investigació Química

Indice

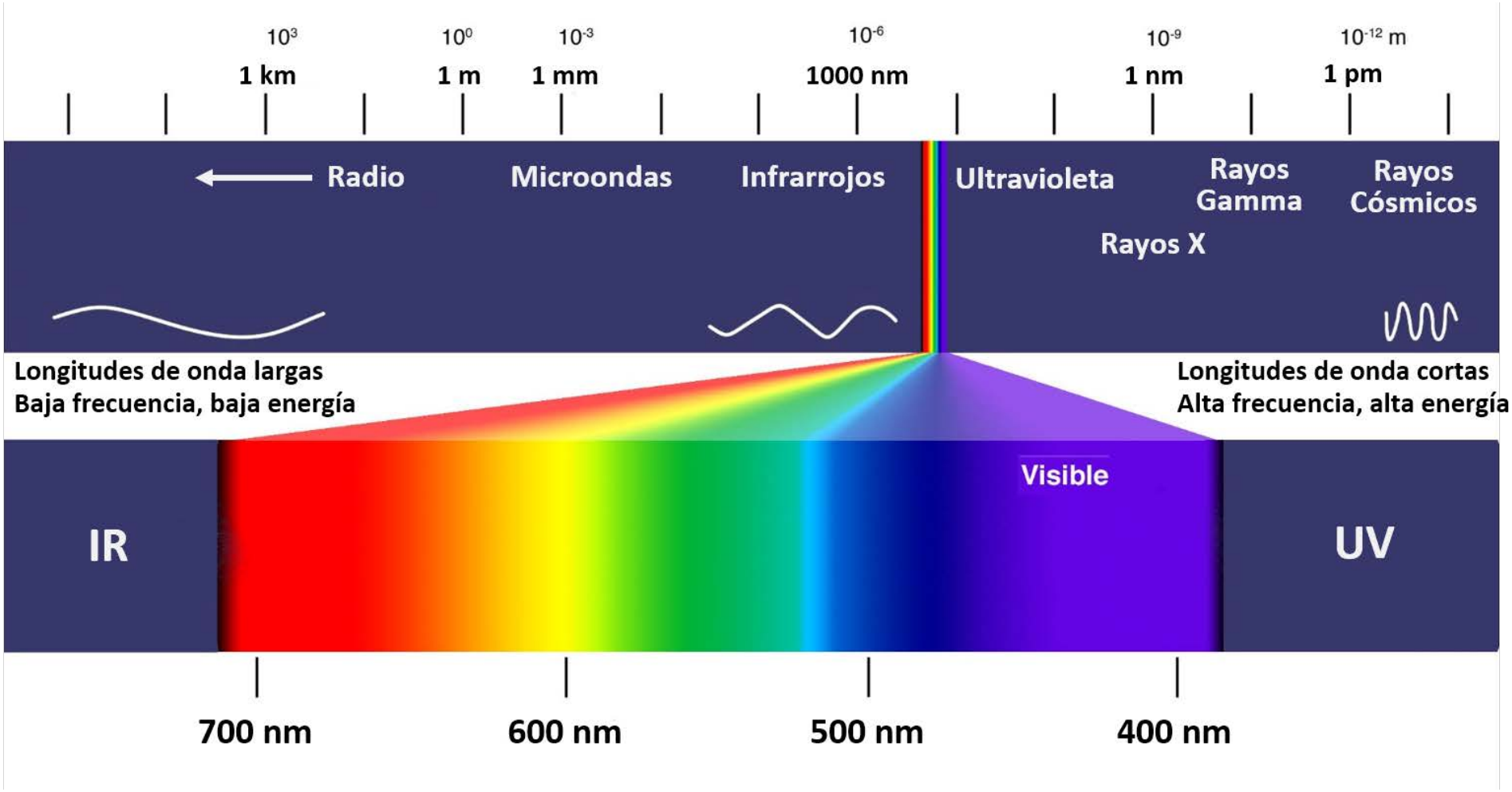
1. Radiación electromagnética.
2. Color. Absorción y Reflexión de Luz.
3. Fluorescencia. Emisión de Luz.

Radiación electromagnética

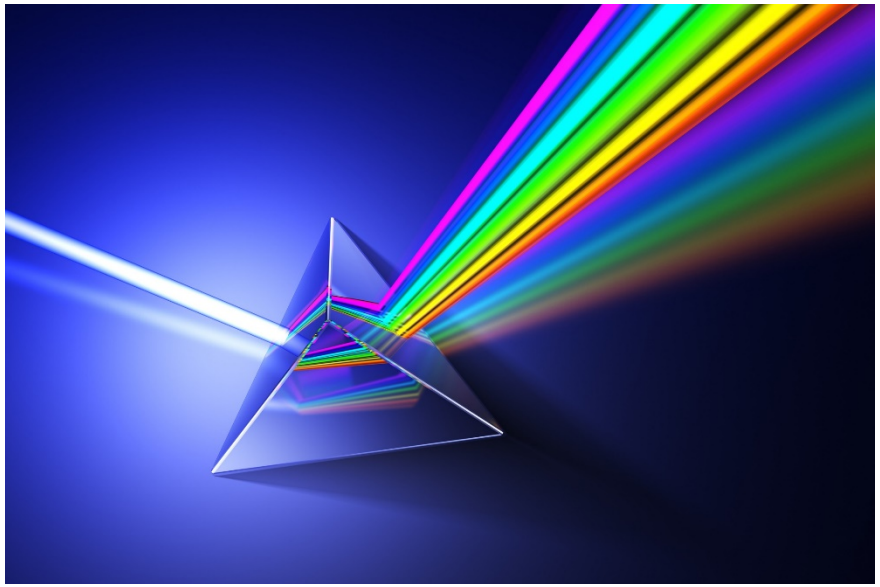


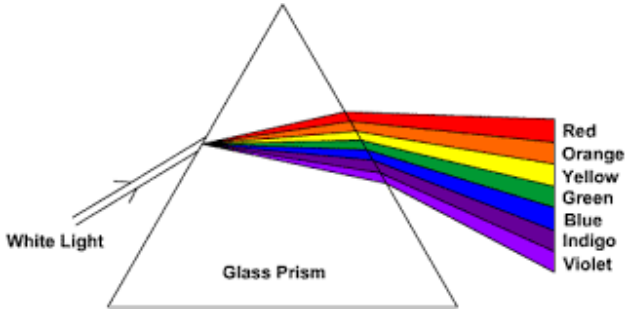


Color

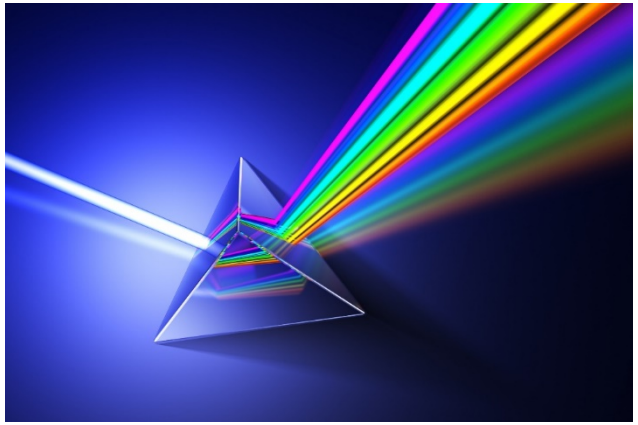

10^{3}
1 km
10^{0}
1 m
10^{-3}
1 mm
10^{-6}
1000 nm
10^{-9}
1 nm
10^{-12} m
1 pm
Radio
Microondas
Infrarrojos
Ultravioleta
Rayos X
Rayos Gamma
Rayos Cósmicos
Longitudes de onda largas
Baja frecuencia, baja energía
Longitudes de onda cortas
Alta frecuencia, alta energía
IR
Visible
UV
700 nm
600 nm
500 nm
400 nm

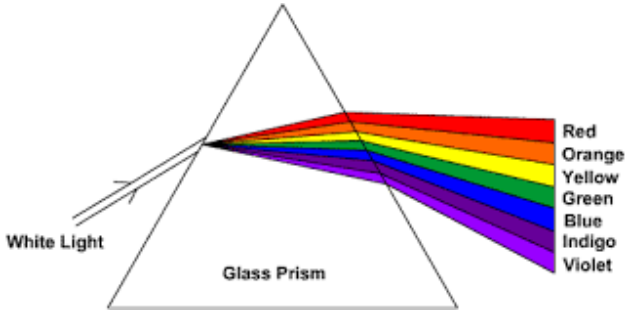
Fundamentos de Color





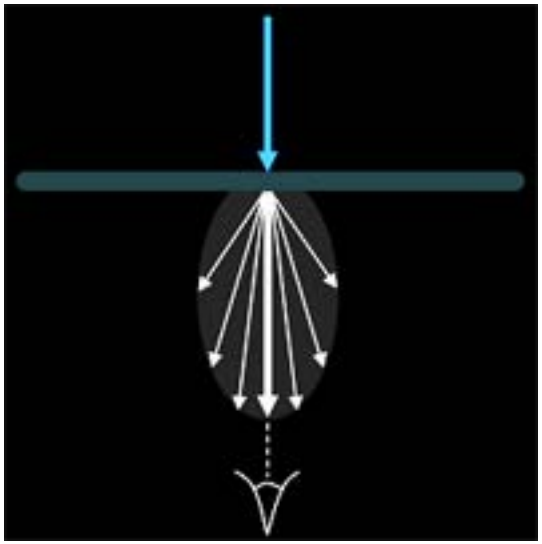
Fundamentos de Color



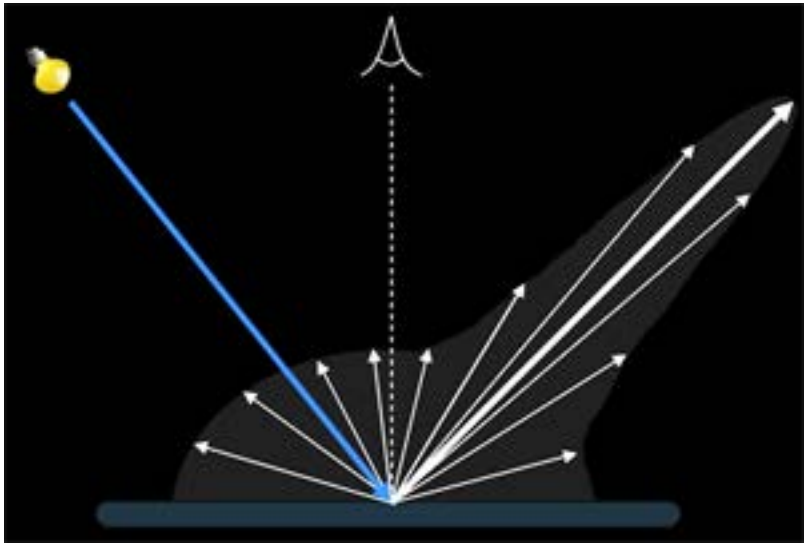


Fundamentos de Color

Transparente

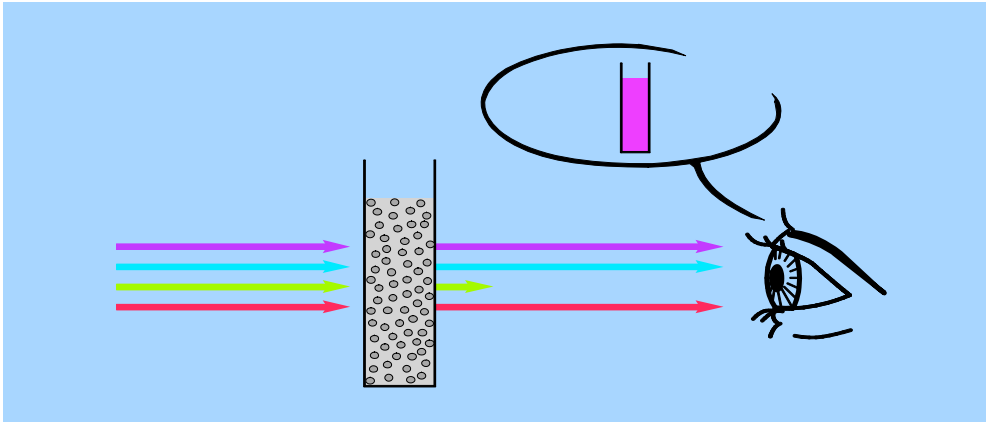


Refleja

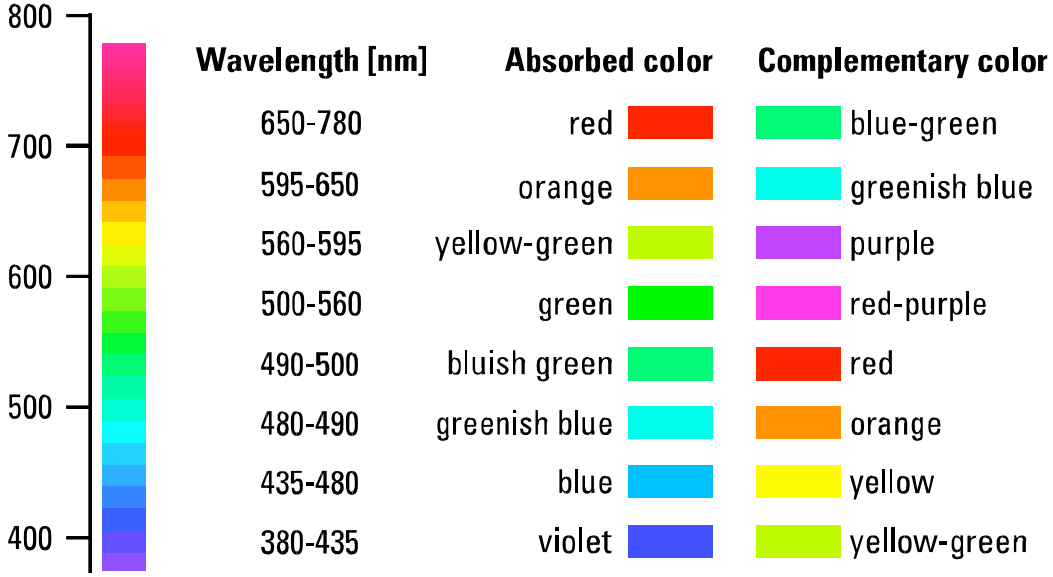


Fundamentos de Color

Materiales transparentes

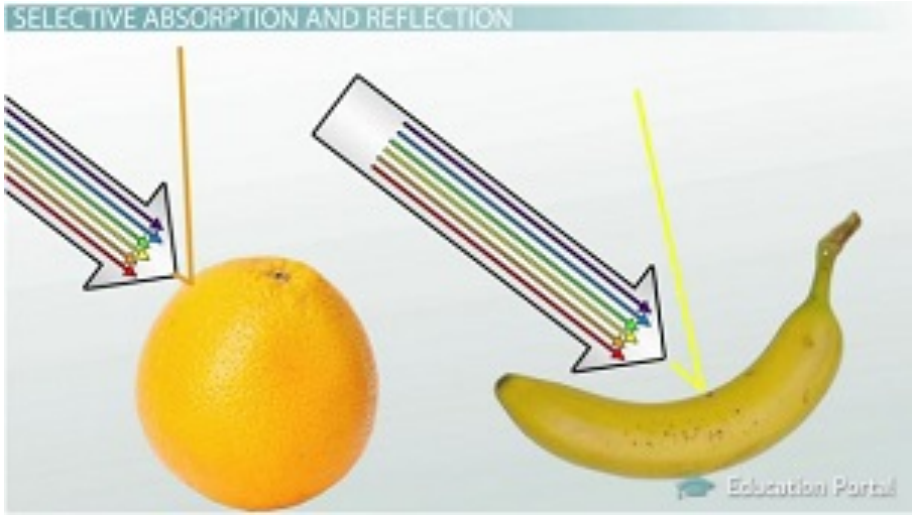


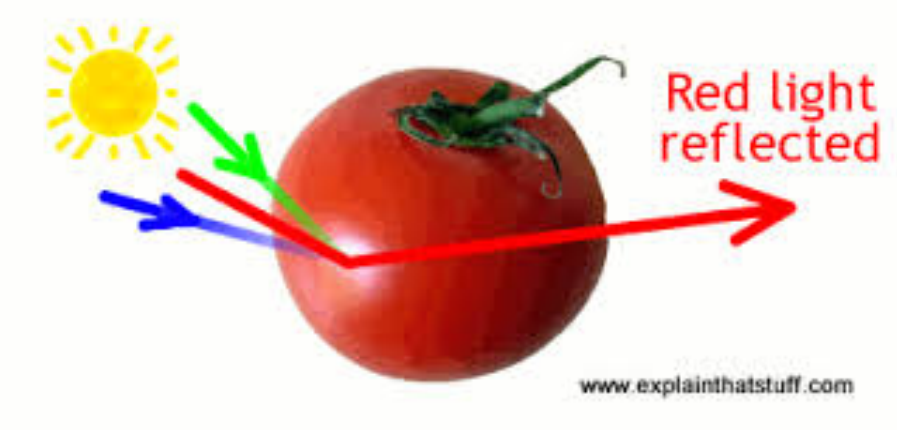
El ojo humano ve el color complementario al que se absorbe



Fundamentos de Color

Objetos NO transparentes



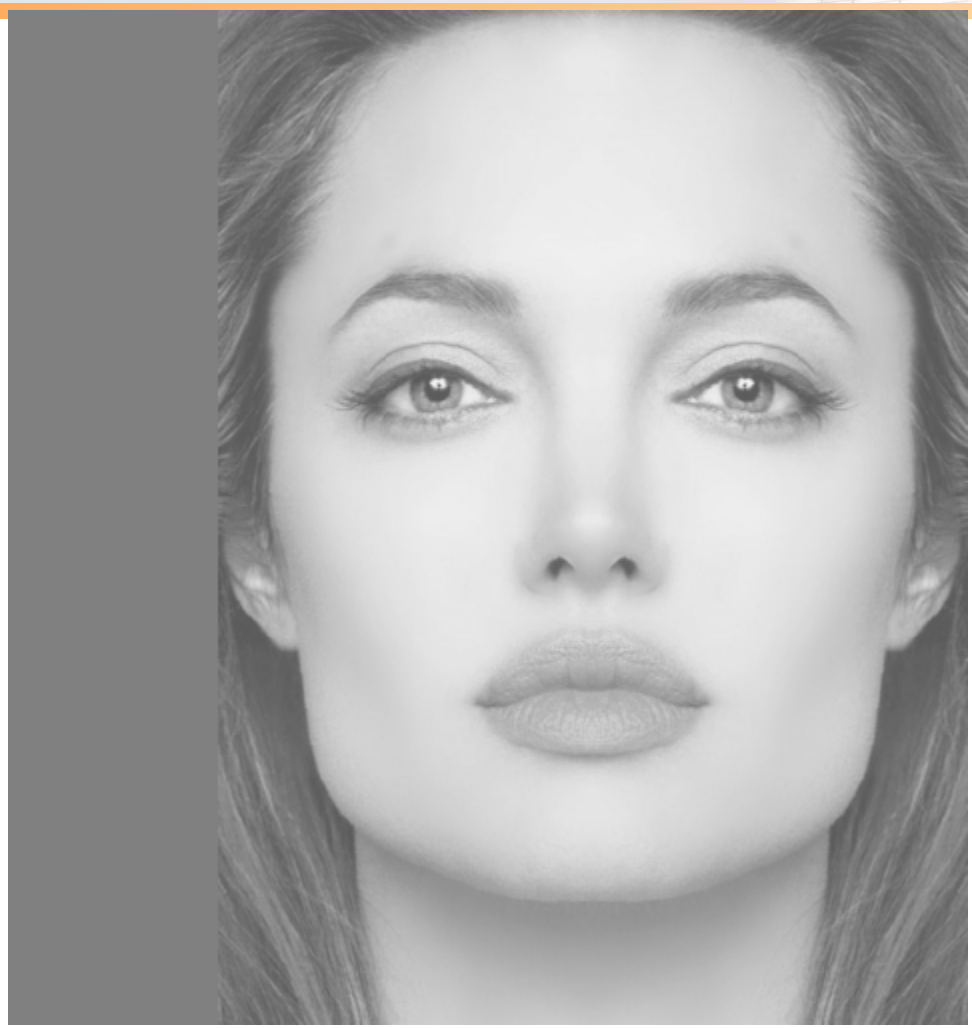


Fundamentos de Color

Las plantas se ven verdes porque “rechazan”el verde

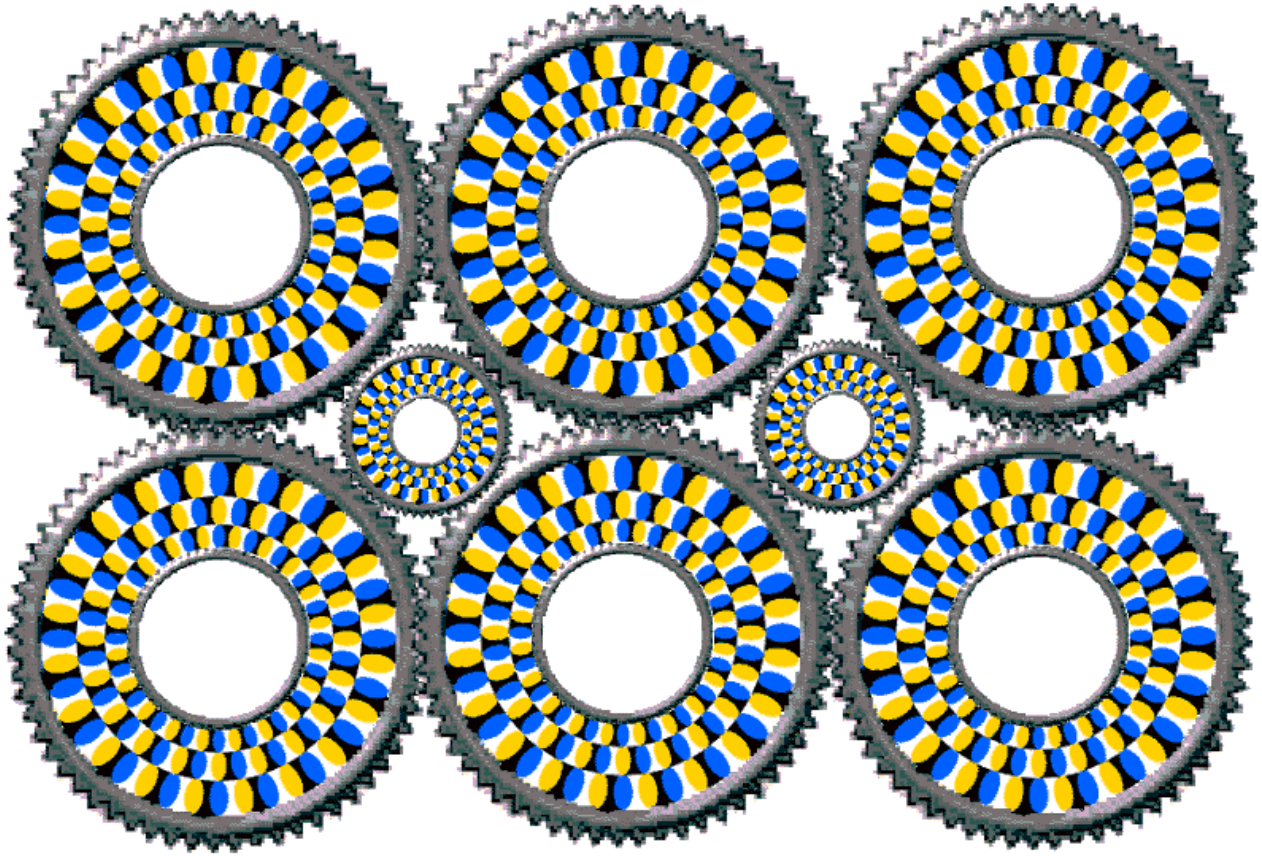
Fundamentos de Color

Percepción del Color



http://www.michaelbach.de/ot/col-context/index.html

Percepción del Color



Derived from a design by A. Kitaoka

Percepción del Color

NO LEA el texto, diga en voz alta el COLOR de las palabras

AMARILLO AZUL NARANJA

NEGRO ROJO VERDE

VIOLETA AMARILLO ROJO

NARANJA VERDE NEGRO

AZUL ROJO VIOLETA

VERDE AZUL NARANJA

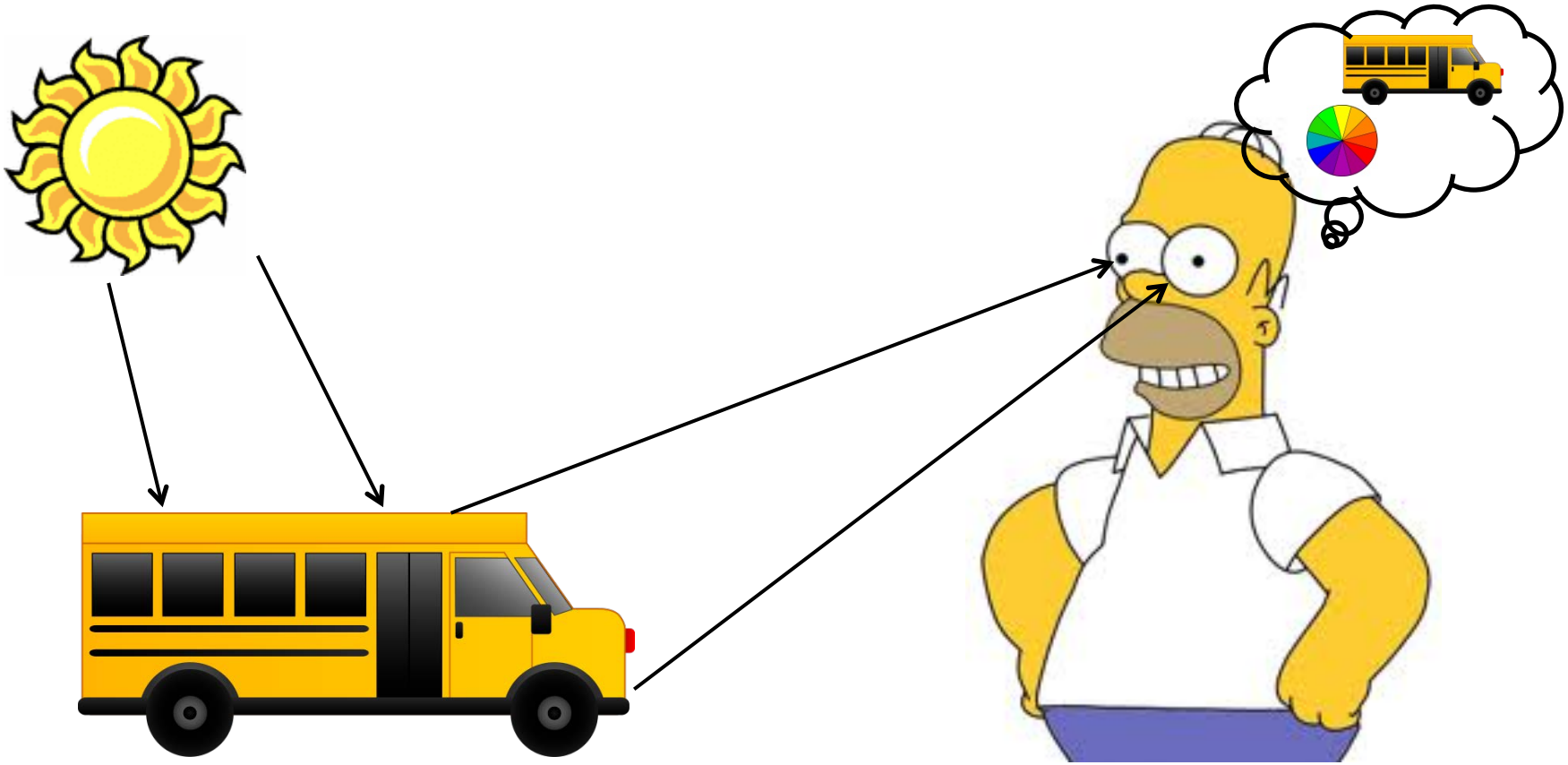
Percepción del Color

Fuente de Luz

Objeto

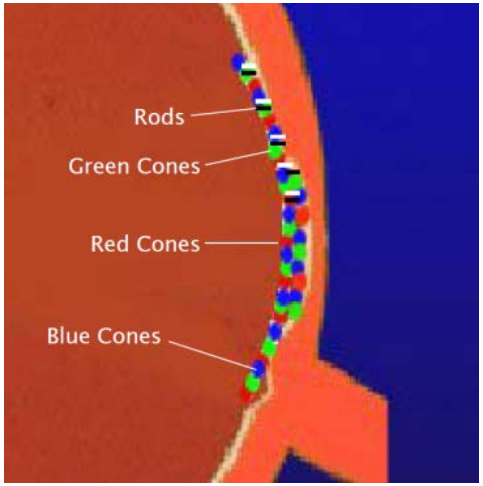
Observador

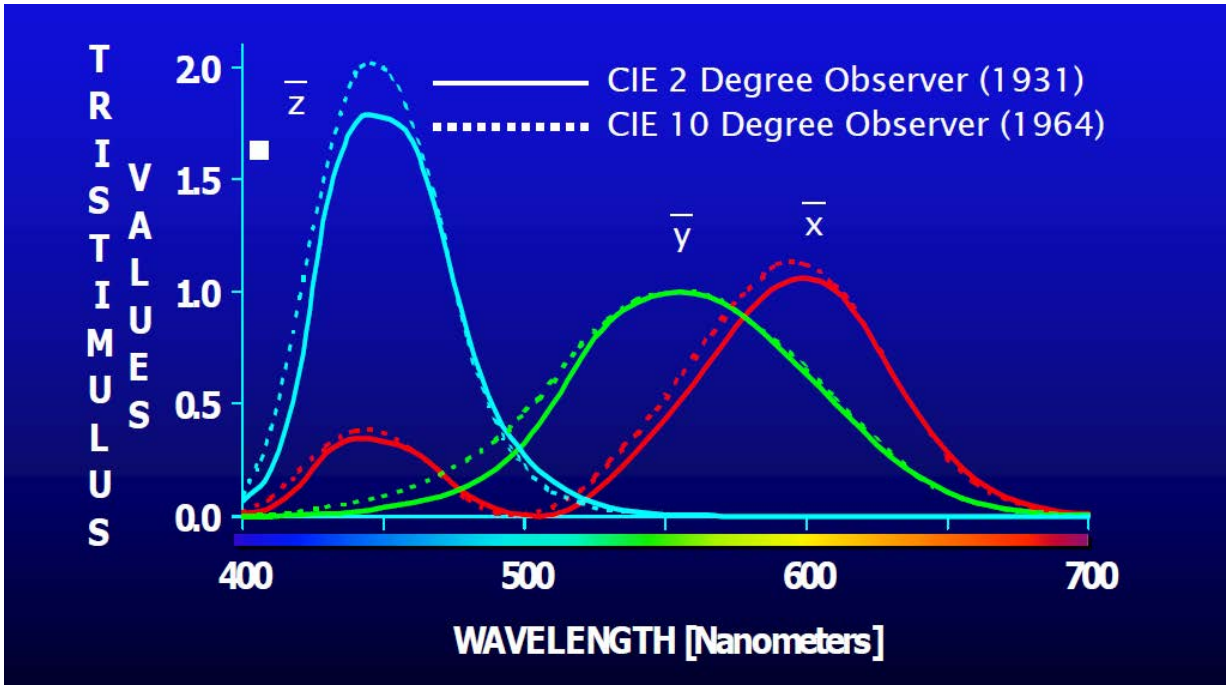
Percepción del Color



Percepción del Color

Ojo Humano



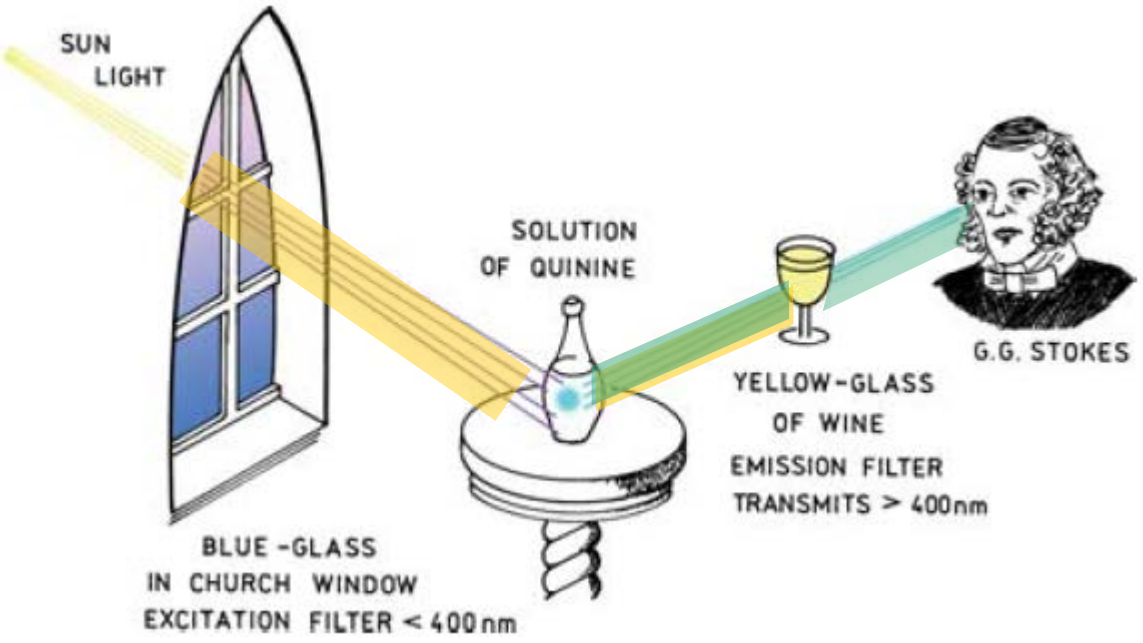


Emisión de Luz

fluorescencia

1. f. Fís. Luminiscencia debida a la excitación de una sustancia que absorbe radiaciones, y que cesa al desaparecer dicha excitación.

Stokes



Emisión de Luz

fluorescencia

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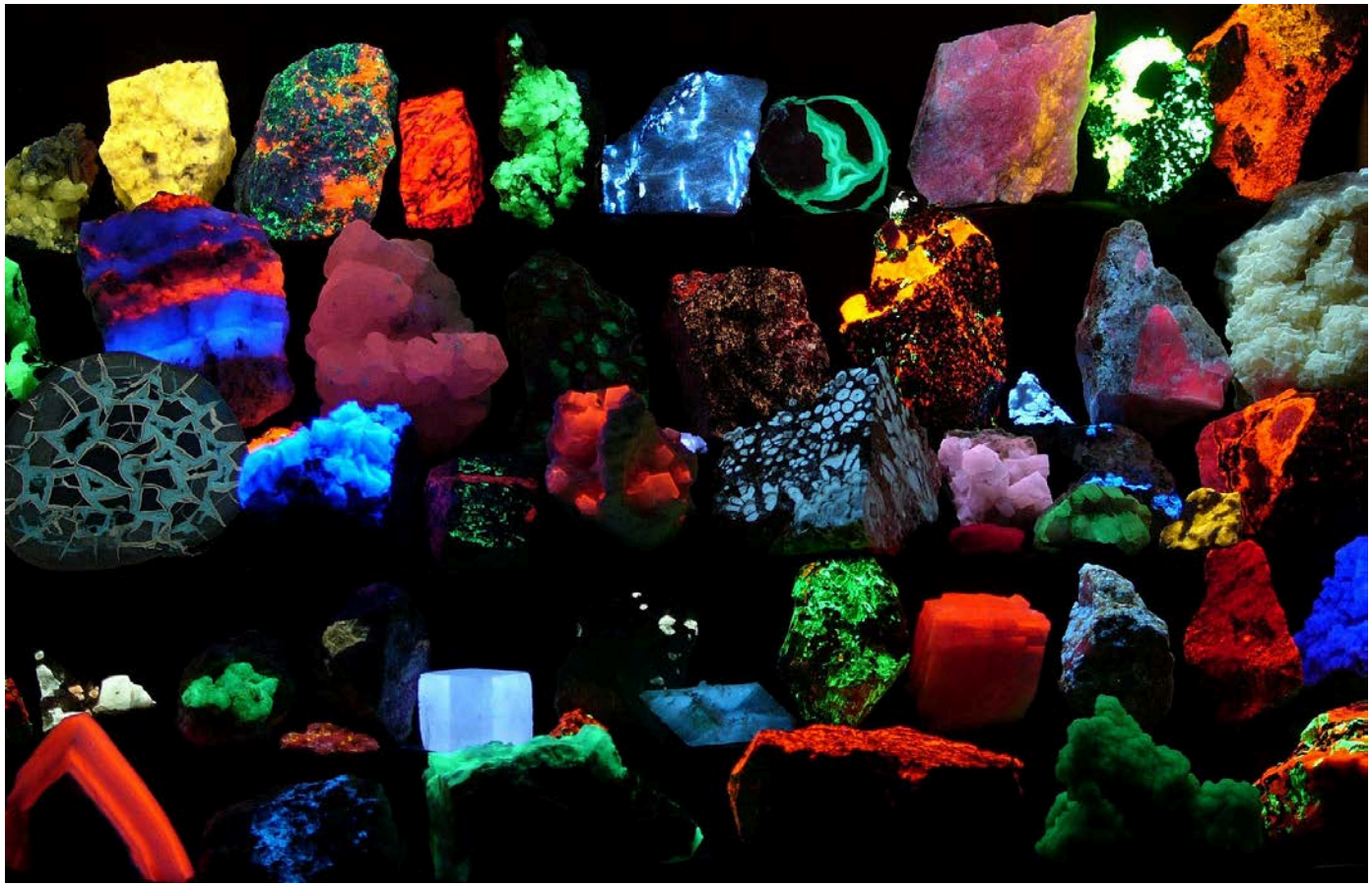
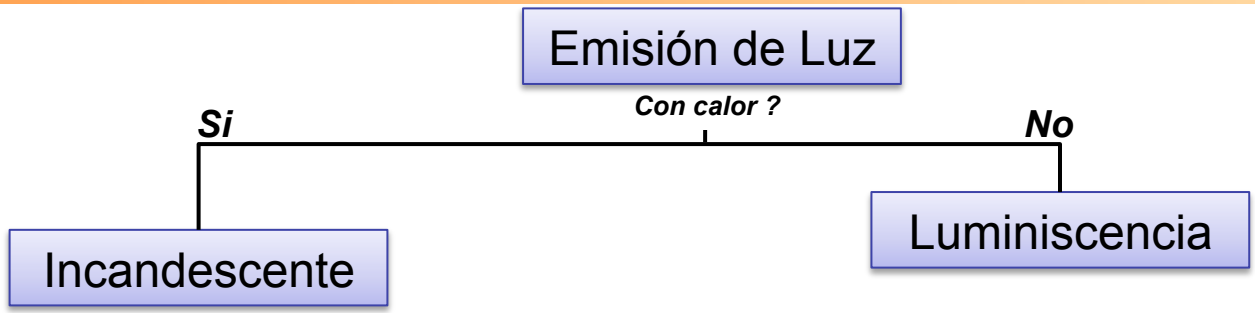


Emisión de Luz



Emisión de Luz

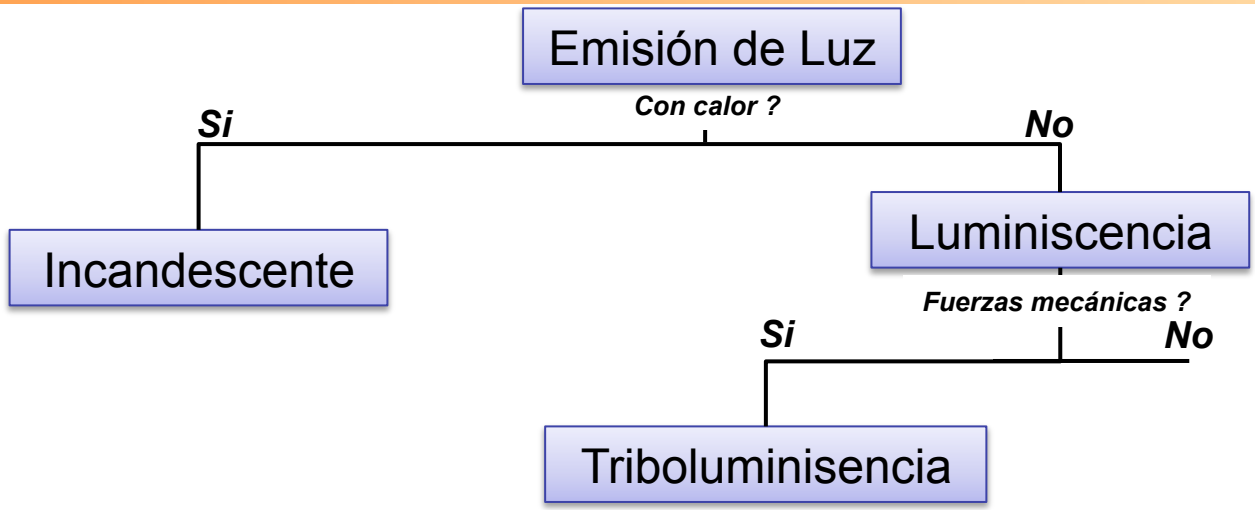
Emisión de Luz

Con calor ?

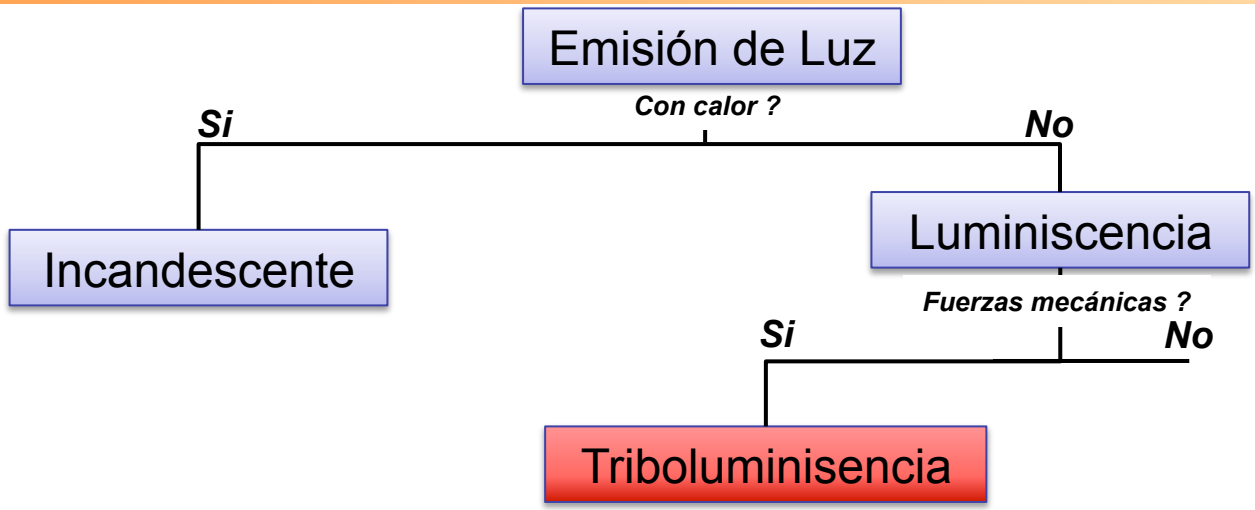
Si → Incandescente

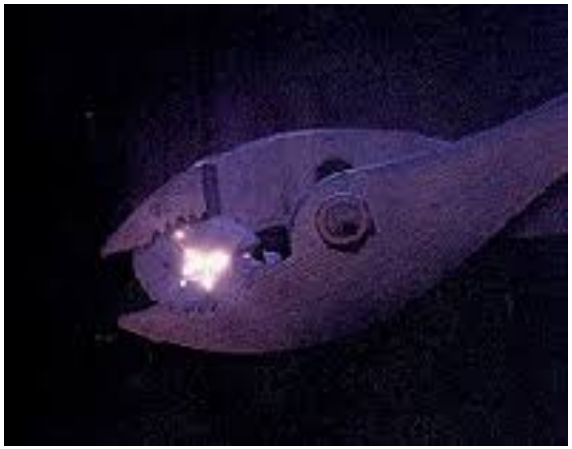
No → Luminiscencia

Emisión de Luz

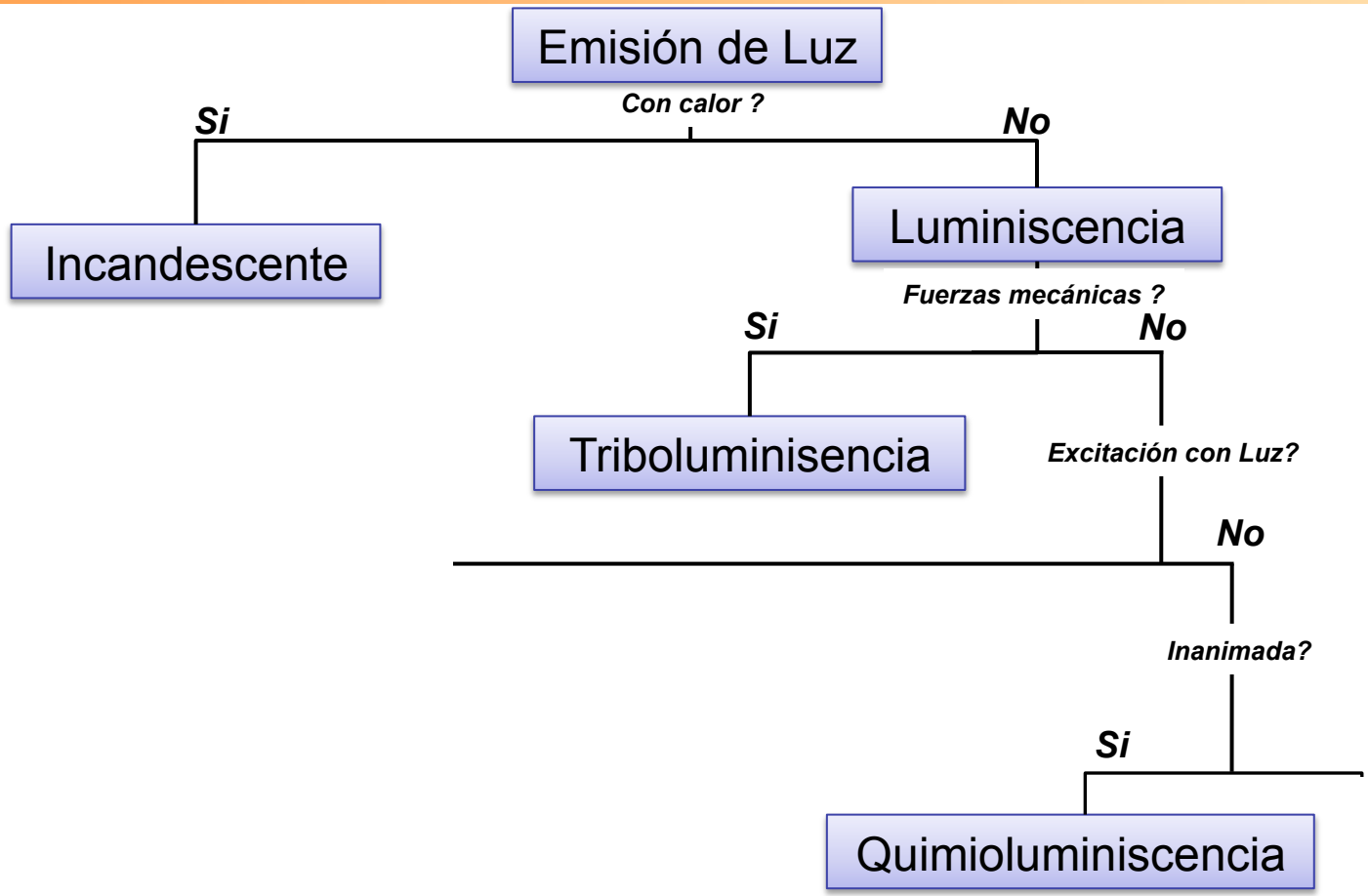


Emisión de Luz

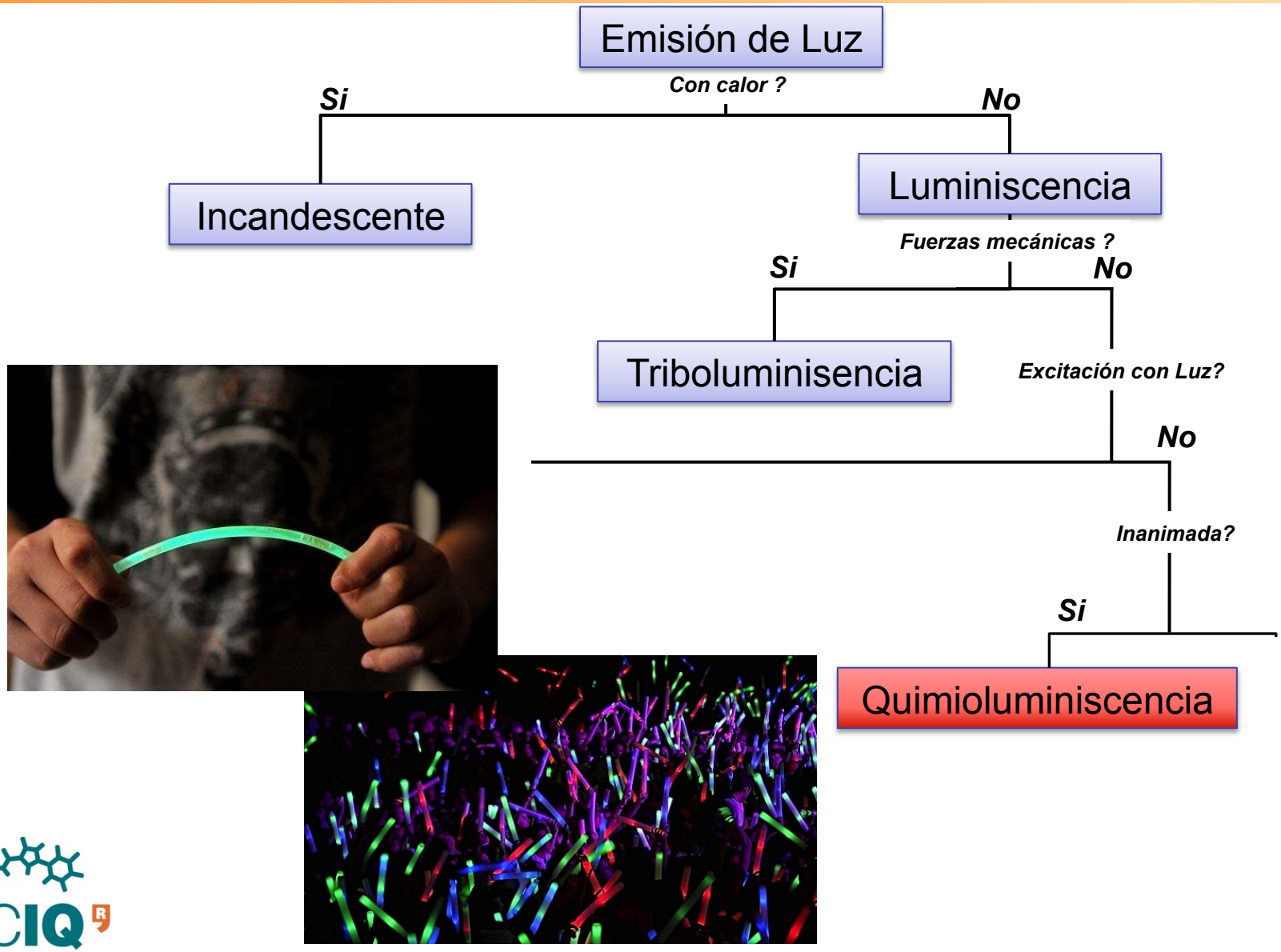




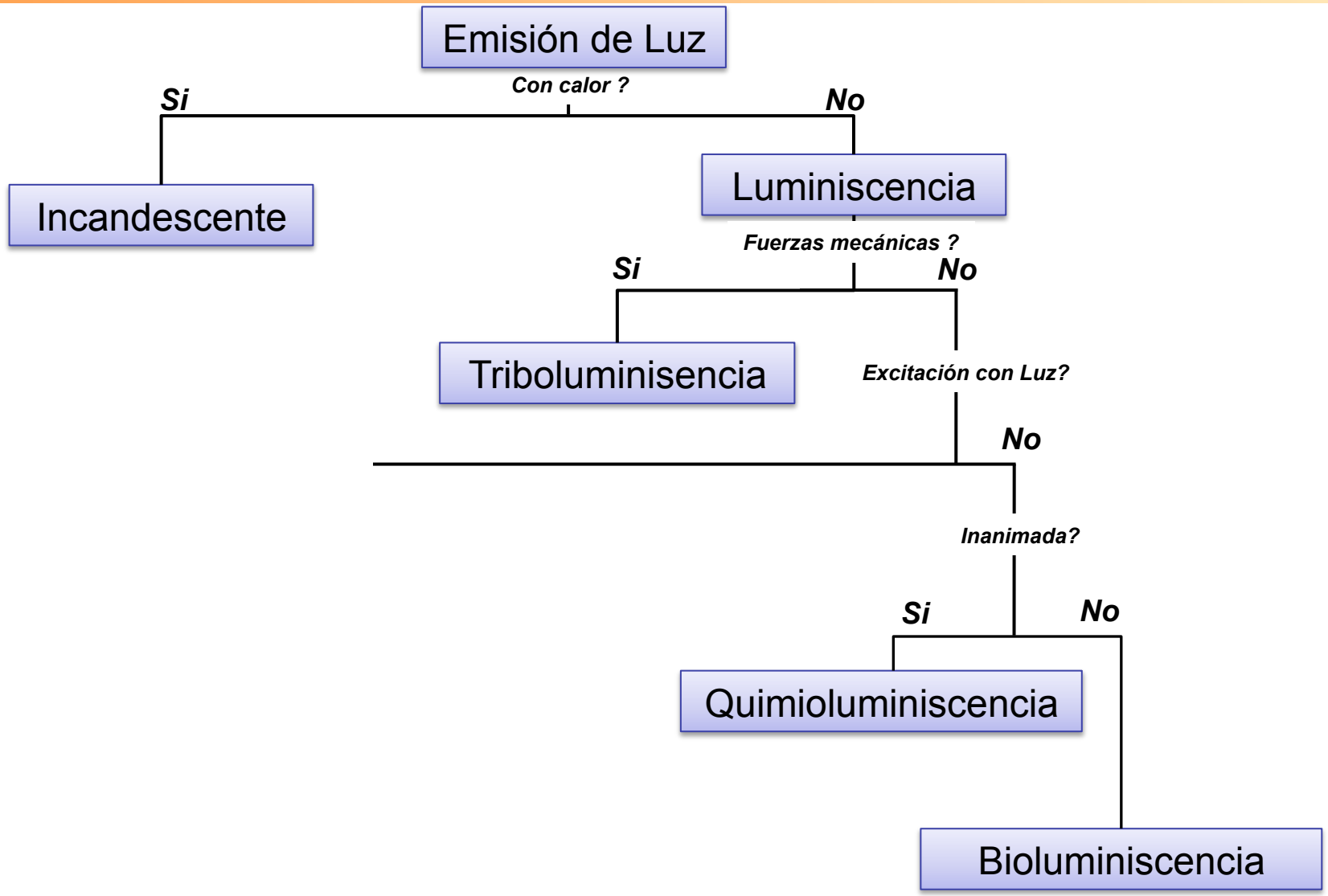
Emisión de Luz



Emisión de Luz



Emisión de Luz



Emisión de Luz

Emisión de Luz

Con calor ?

Si → Incandescente

No → Luminiscencia

Fuerzas mecánicas ?

Si → Triboluminisencia

No → *Excitación con Luz?*

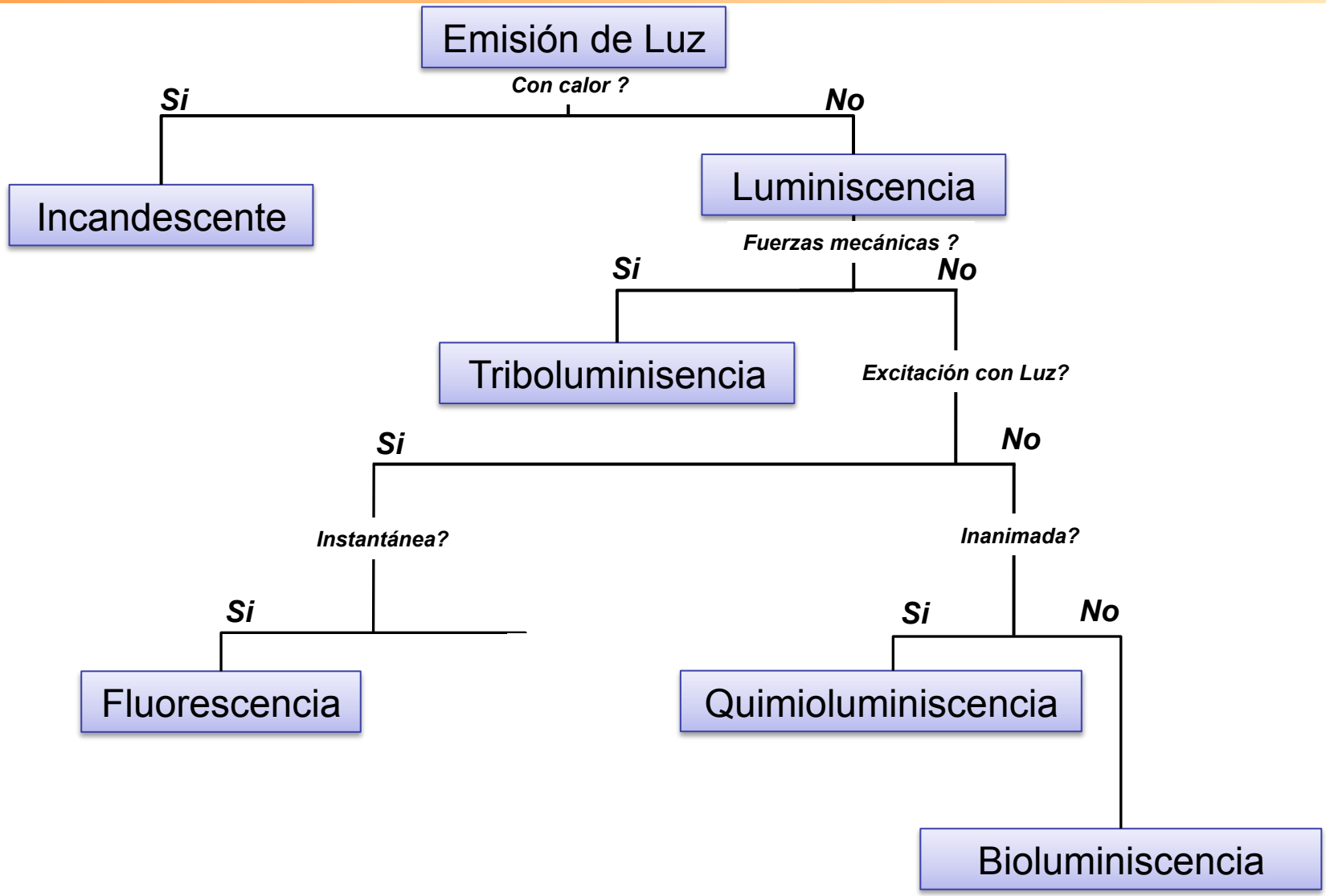
No → *Inanimada?*

Si → luminiscencia

No → Bioluminiscencia

ICIQ

Emisión de Luz



Emisión de Luz

Emisión de Luz

Con calor ?

Si

No

Luminiscencia

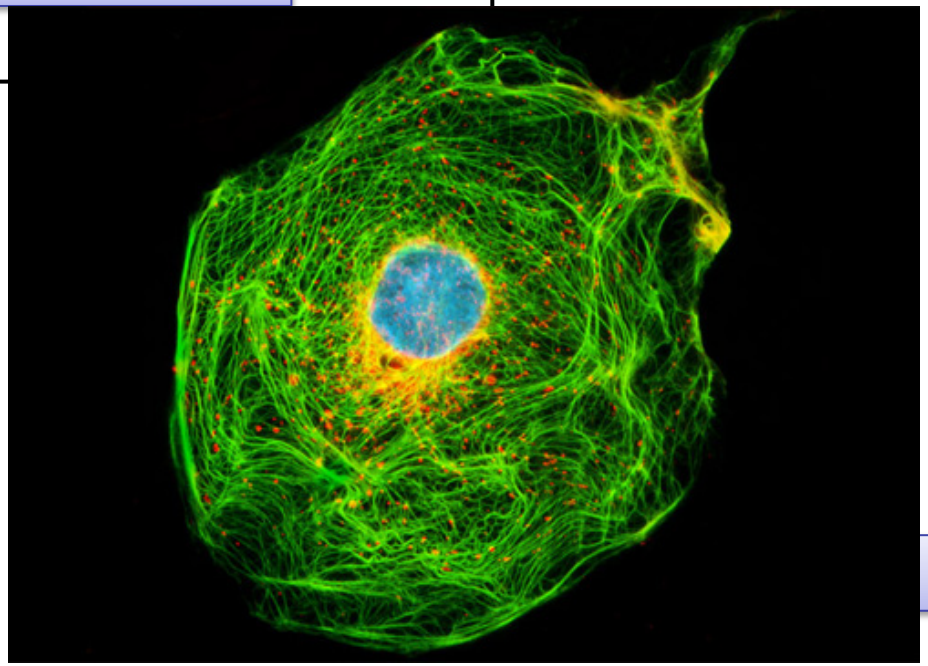
Fuerzas mecánicas ?

Si

No

oluminisencia

Excitación con Luz?

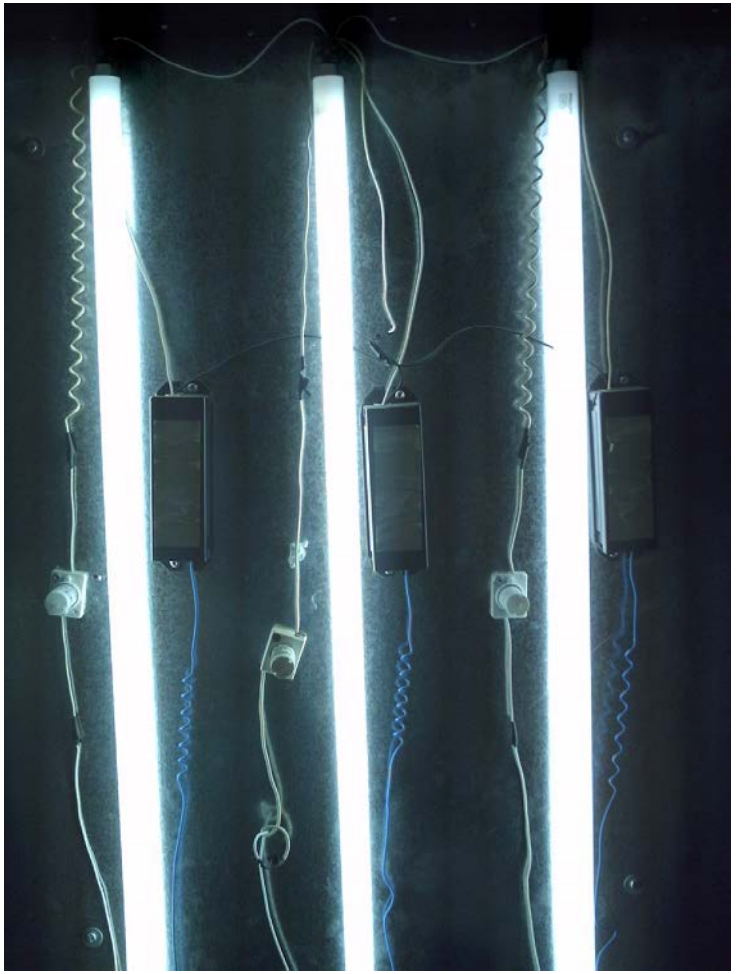


Si

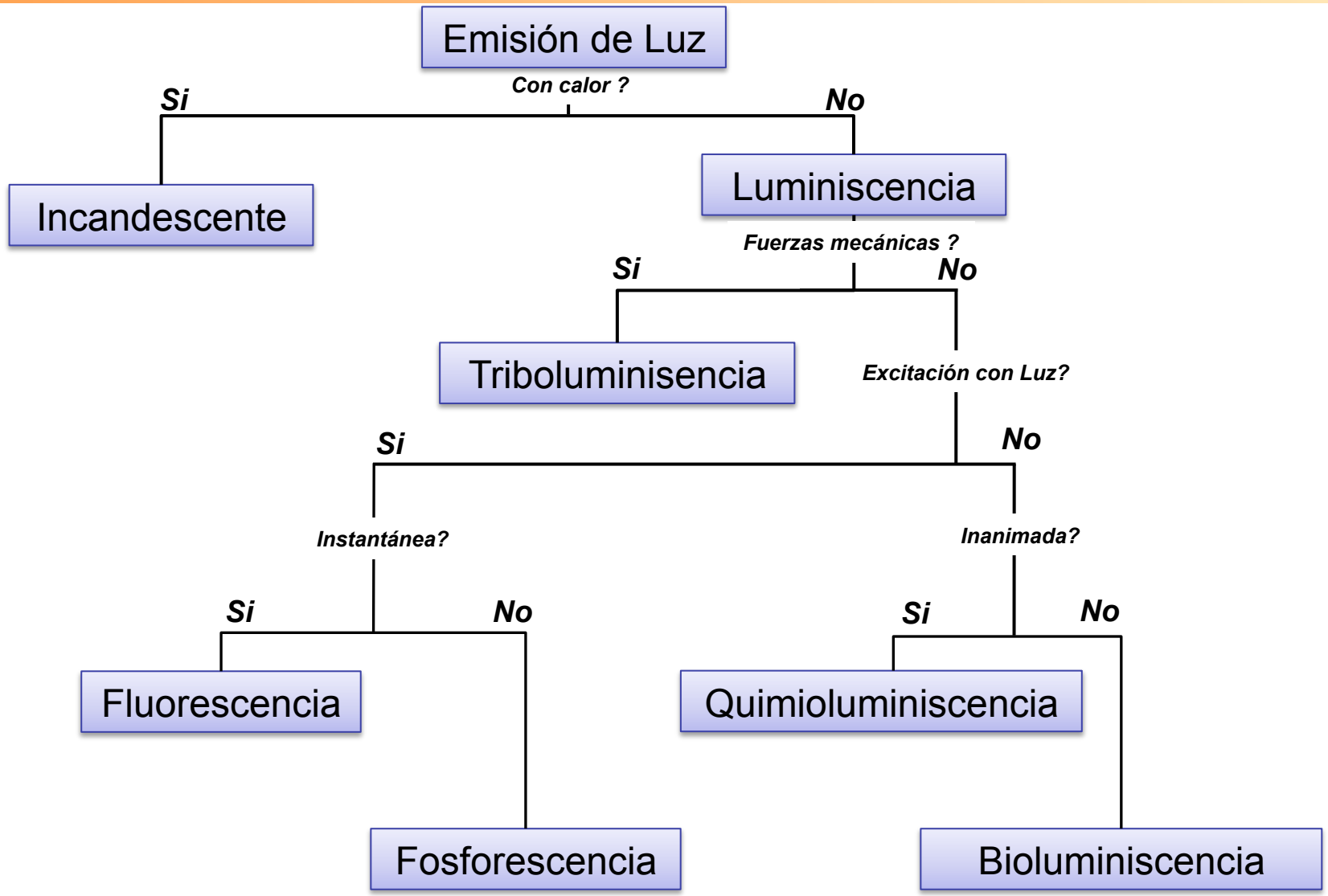
Fluorescencia

Emisión de Luz

Fluorescencia



Emisión de Luz



Emisión de Luz

Emisión de Luz

Con calor ?

Si

No

Luminiscencia

Fuerzas mecánicas ?

Si

No

Tribolu

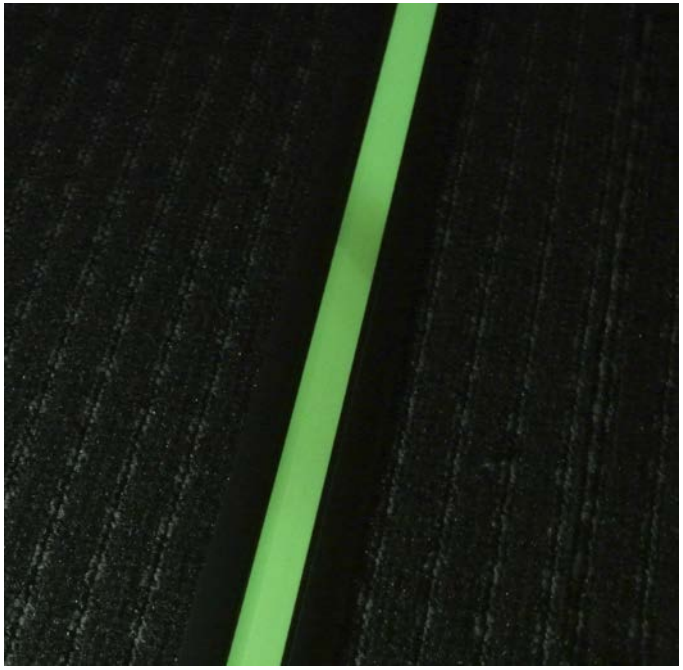
No

Fosforescencia

Bioluminiscencia

Emisión de Luz

Fosforescencia



Premio Nobel de Química 2014

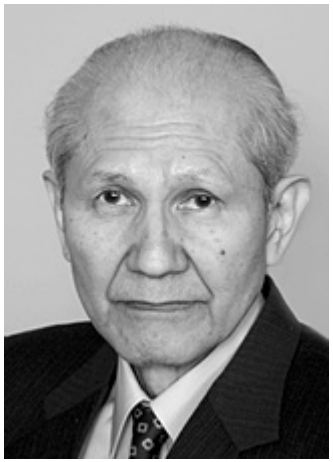
Eric Betzig

Stefan W. Hell

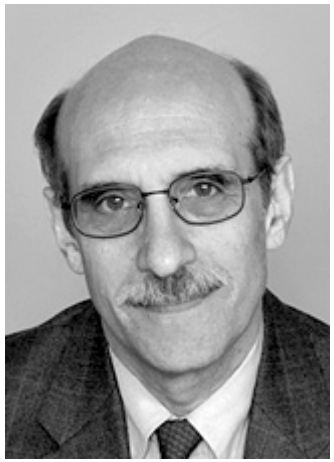
William E. Moerner

The Nobel Prize in Chemistry 2014 was awarded jointly to Eric Betzig, Stefan W. Hell and William E. Moerner *"for the development of super-resolved fluorescence microscopy"*.

Premio Nobel de Química 2008



Osamu Shimomura



Martin Chalfie

Roger Y. Tsien

"for the discovery and development of the green fluorescent protein, GFP".

Aequorea victoria

Gràcies

Computational Chemistry

CO_2 recycling

Renewable Fuels

Catalysis

Artificial Photosynthesis