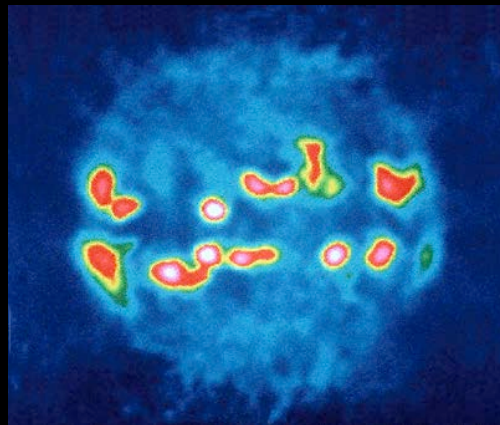
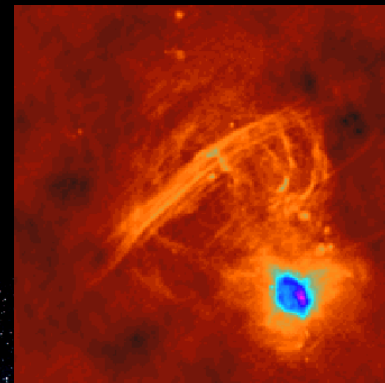
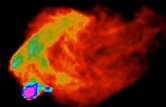
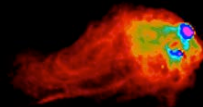
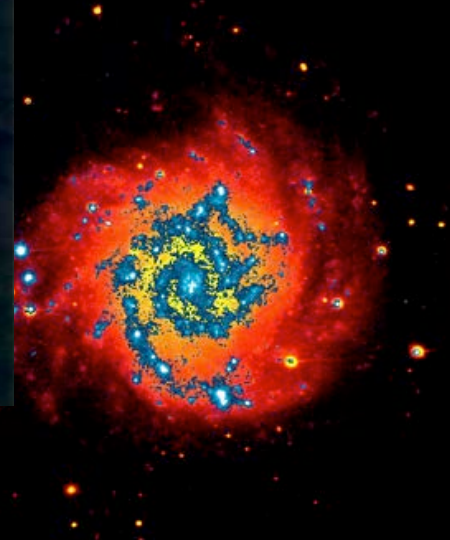
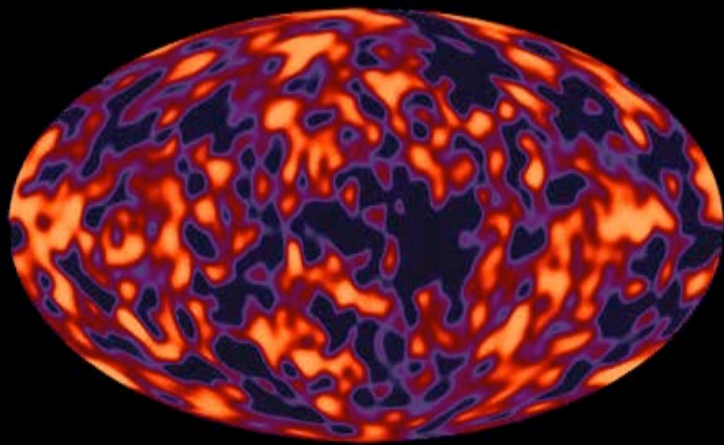


Au-delà de l'arc en ciel



Peter von Ballmoos, Institut de Recherche en Astrophysique et Planétologie, Toulouse

Comment classer les images de l'Univers ?



Comment imaginer *mon* Univers ?



Comment classer les images de *mon* Univers ?



1980

1985

1990

1995

2000

2005

2010

date

Comment classer les images de *mon* Univers ?



cm

m

km

taille

Comment classer les images de *mon* Univers ?



rouge

orange

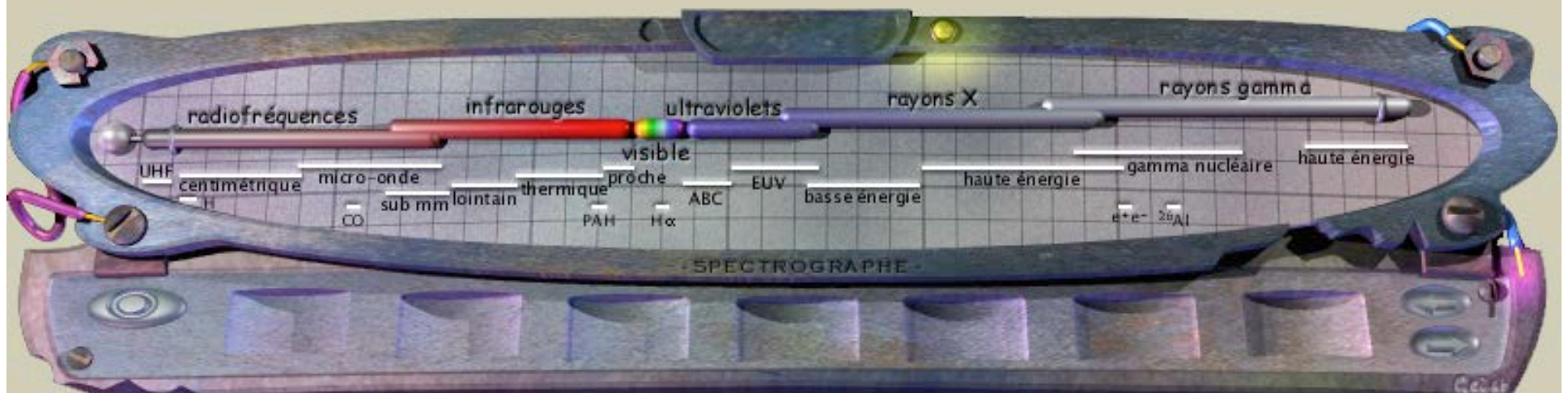
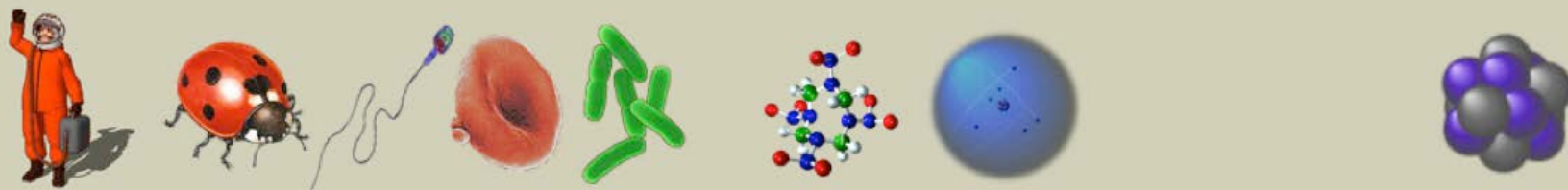
jaune

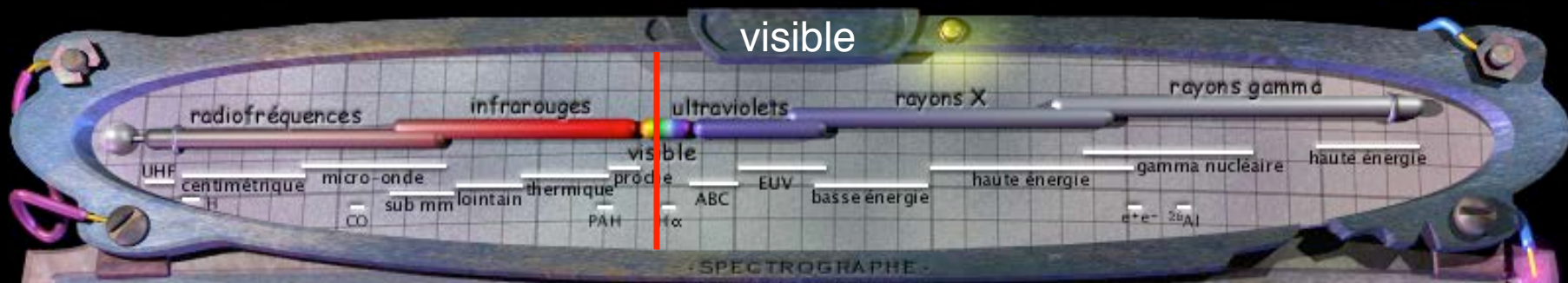
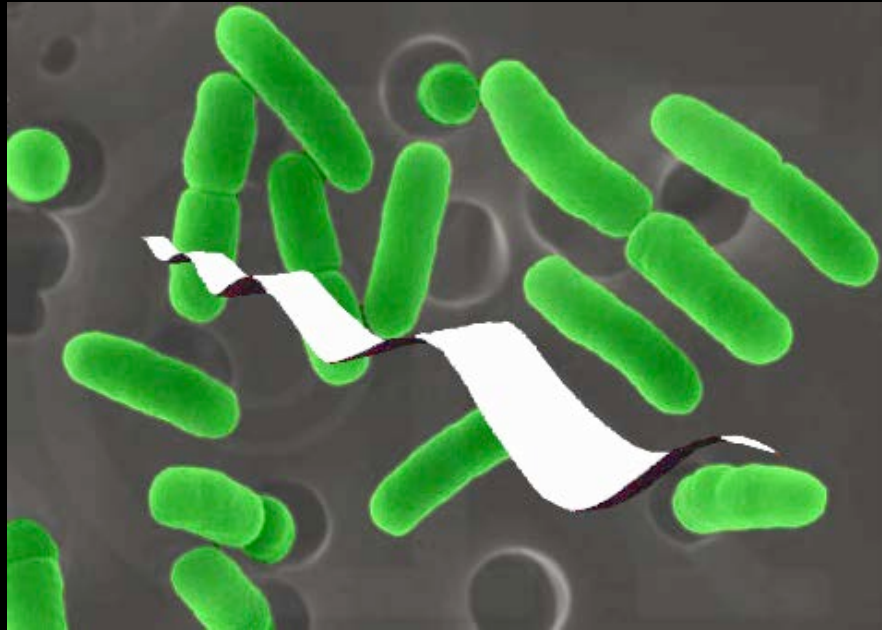
vert

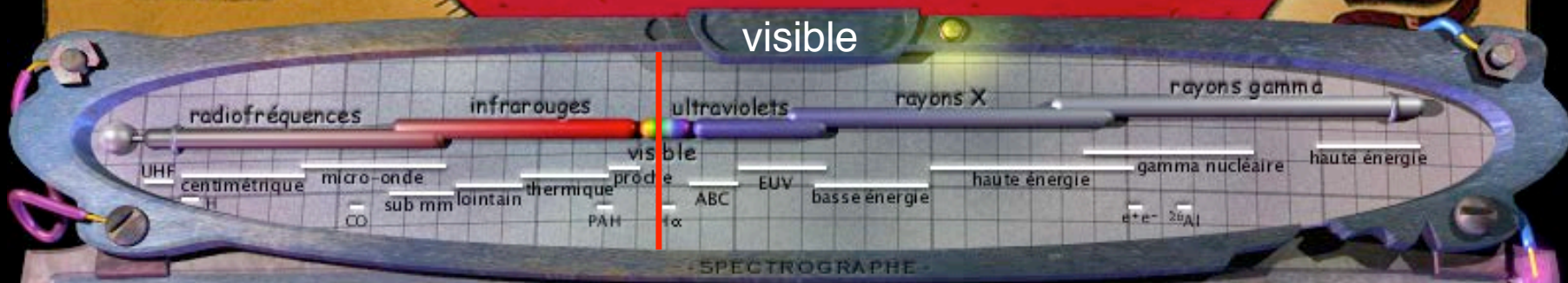
bleu

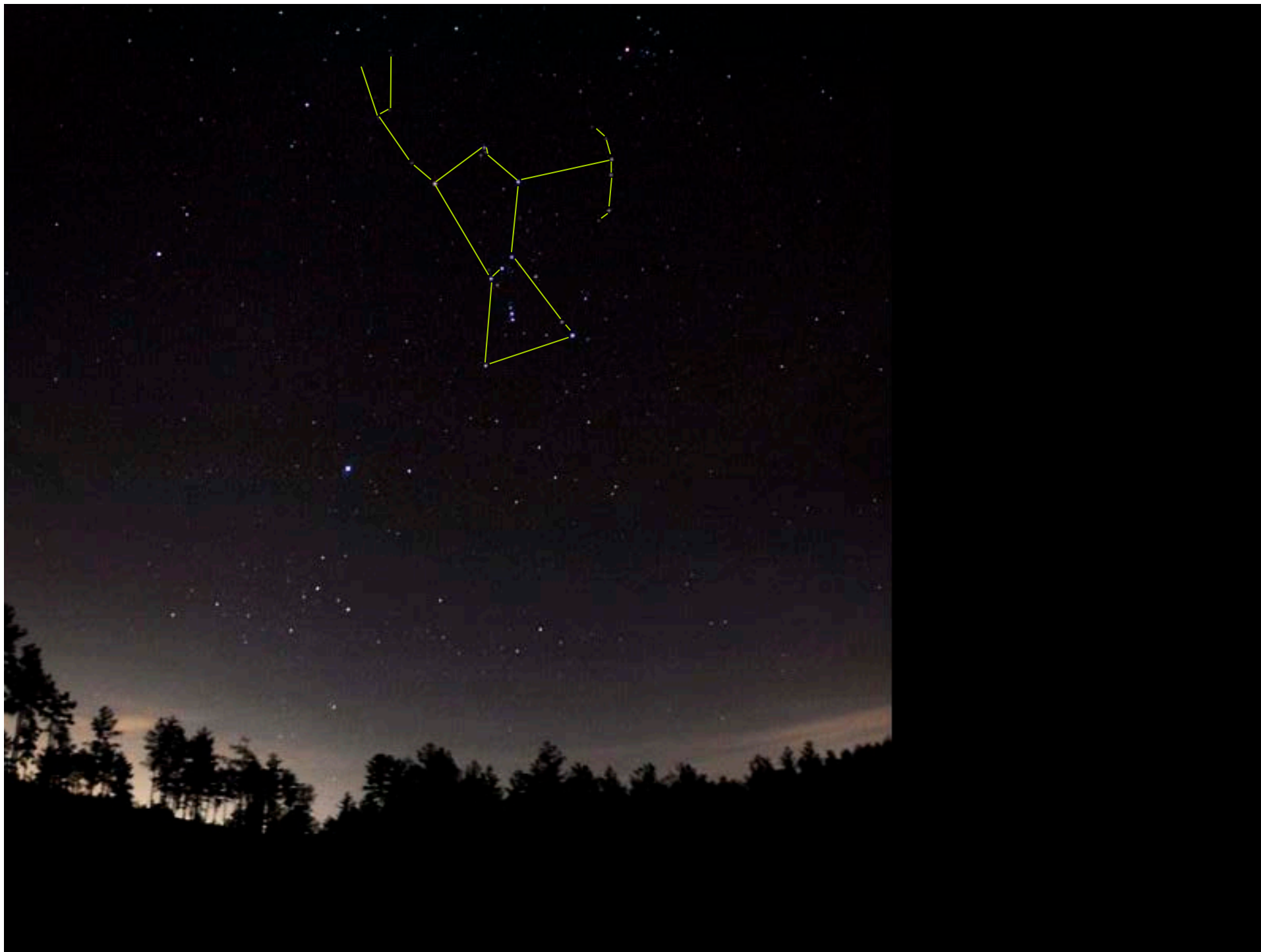
violet

couleurs

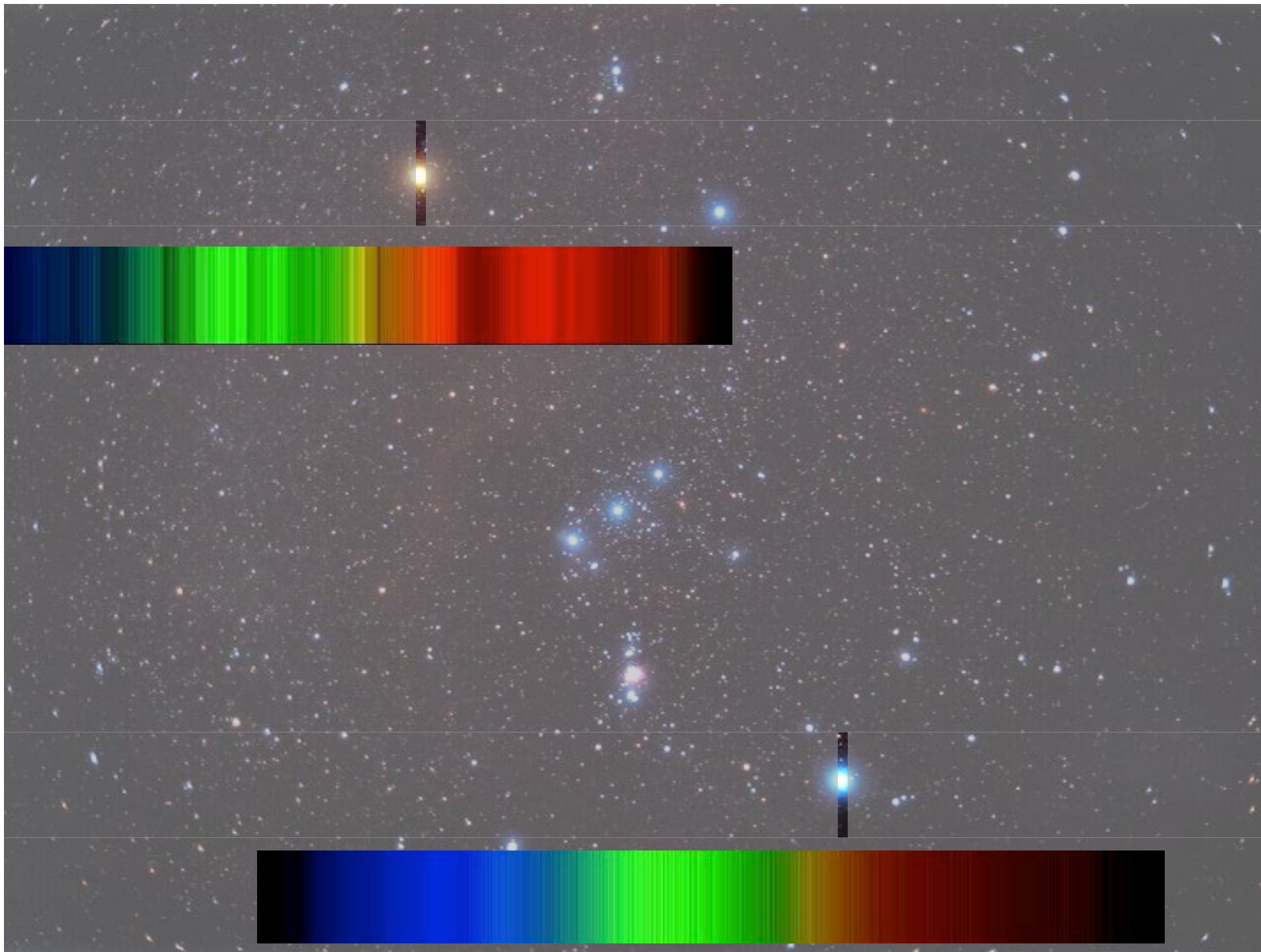




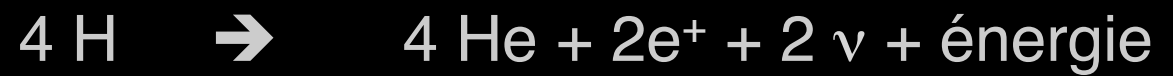
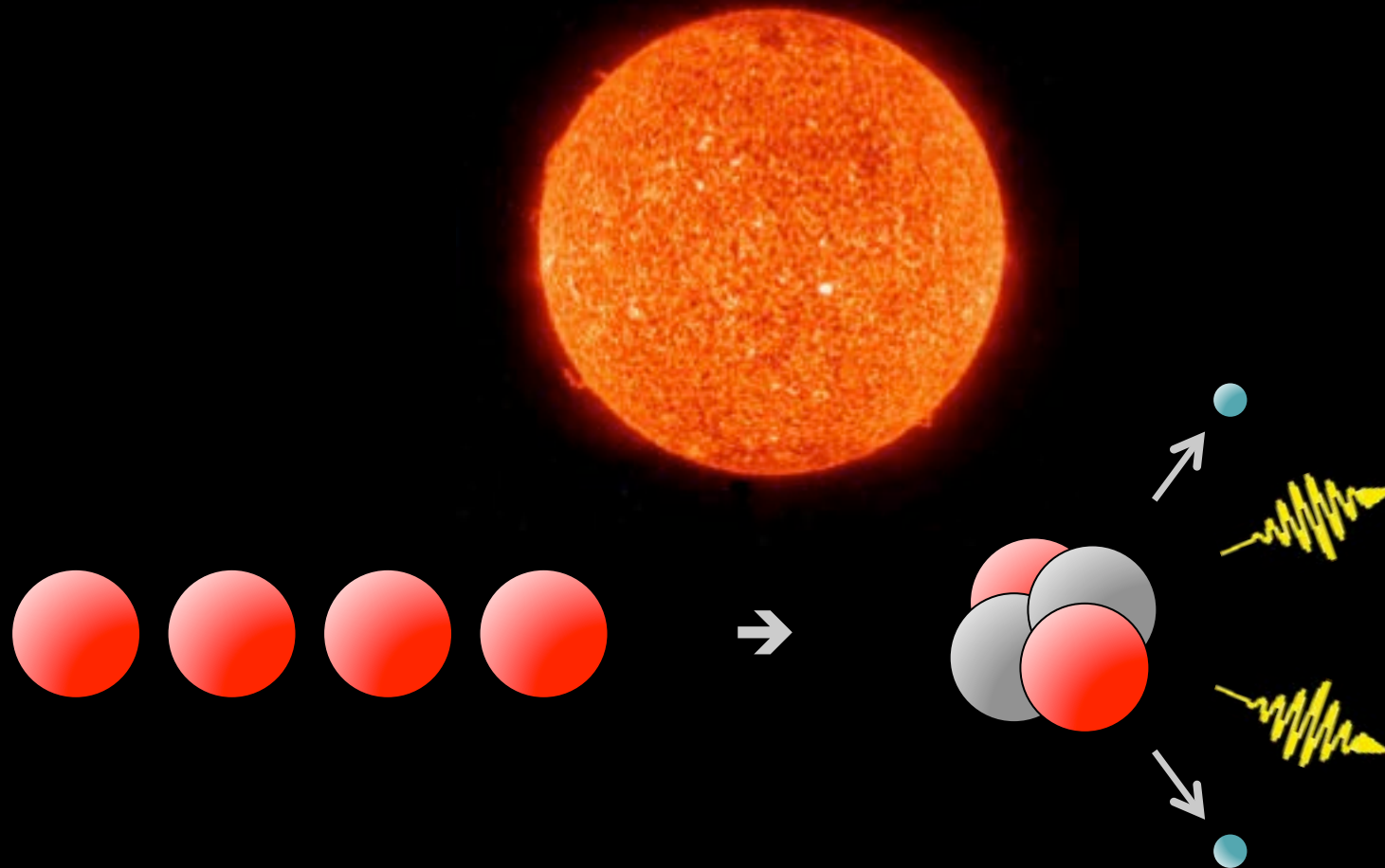




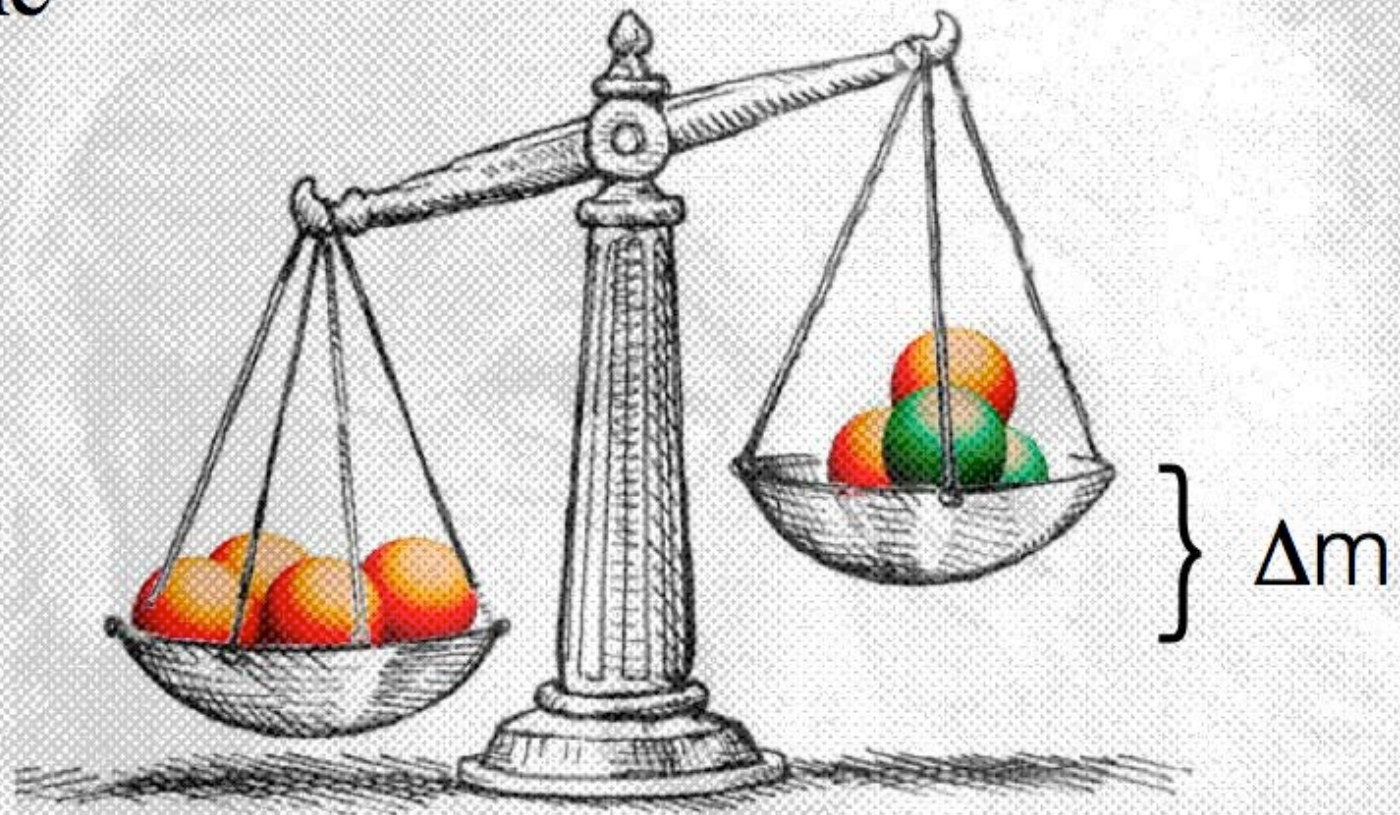




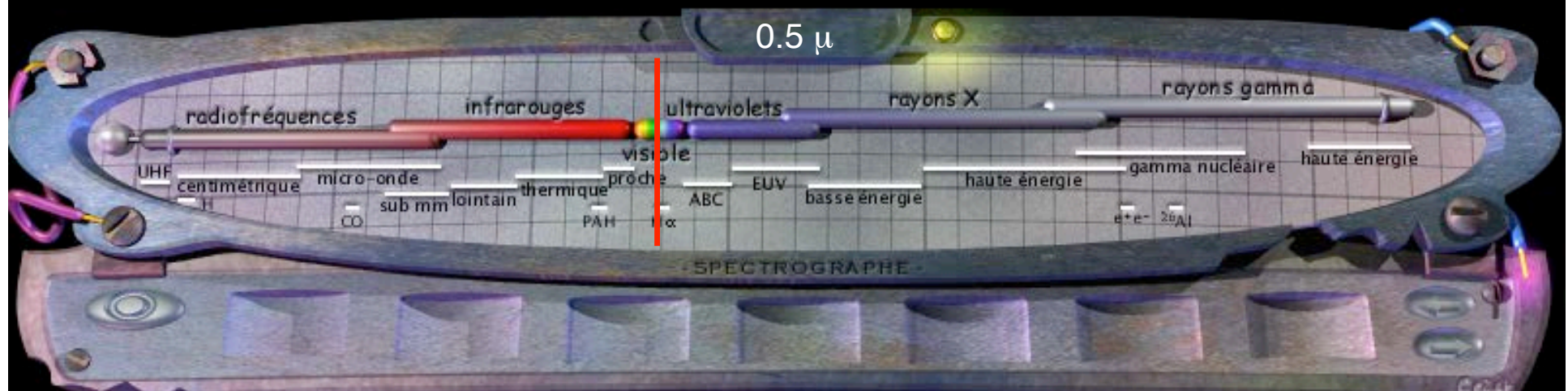
La fusion $H \rightarrow He$ dans le Soleil



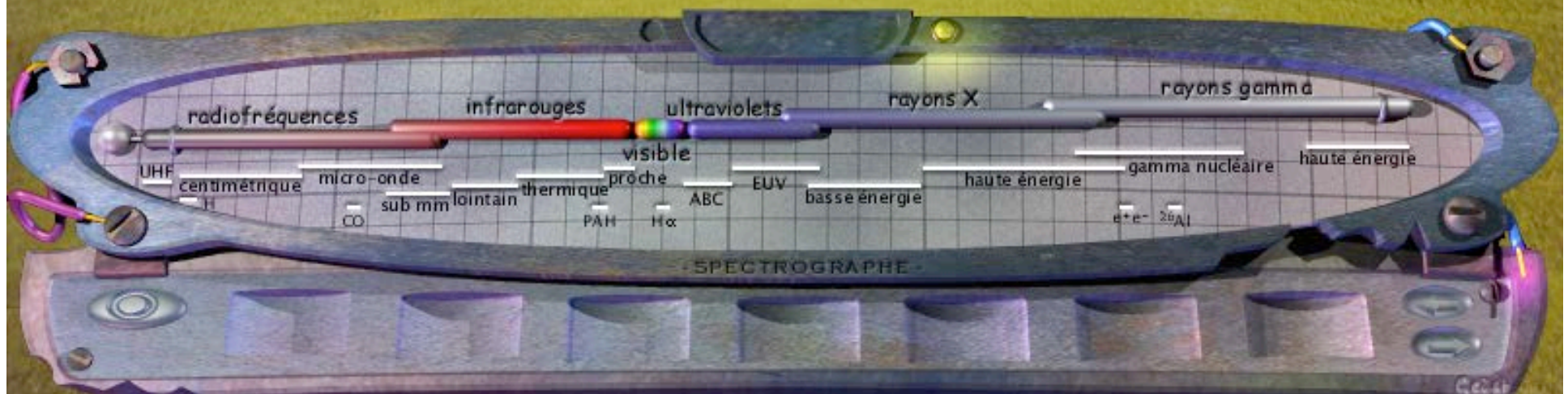
$$E = mc^2$$



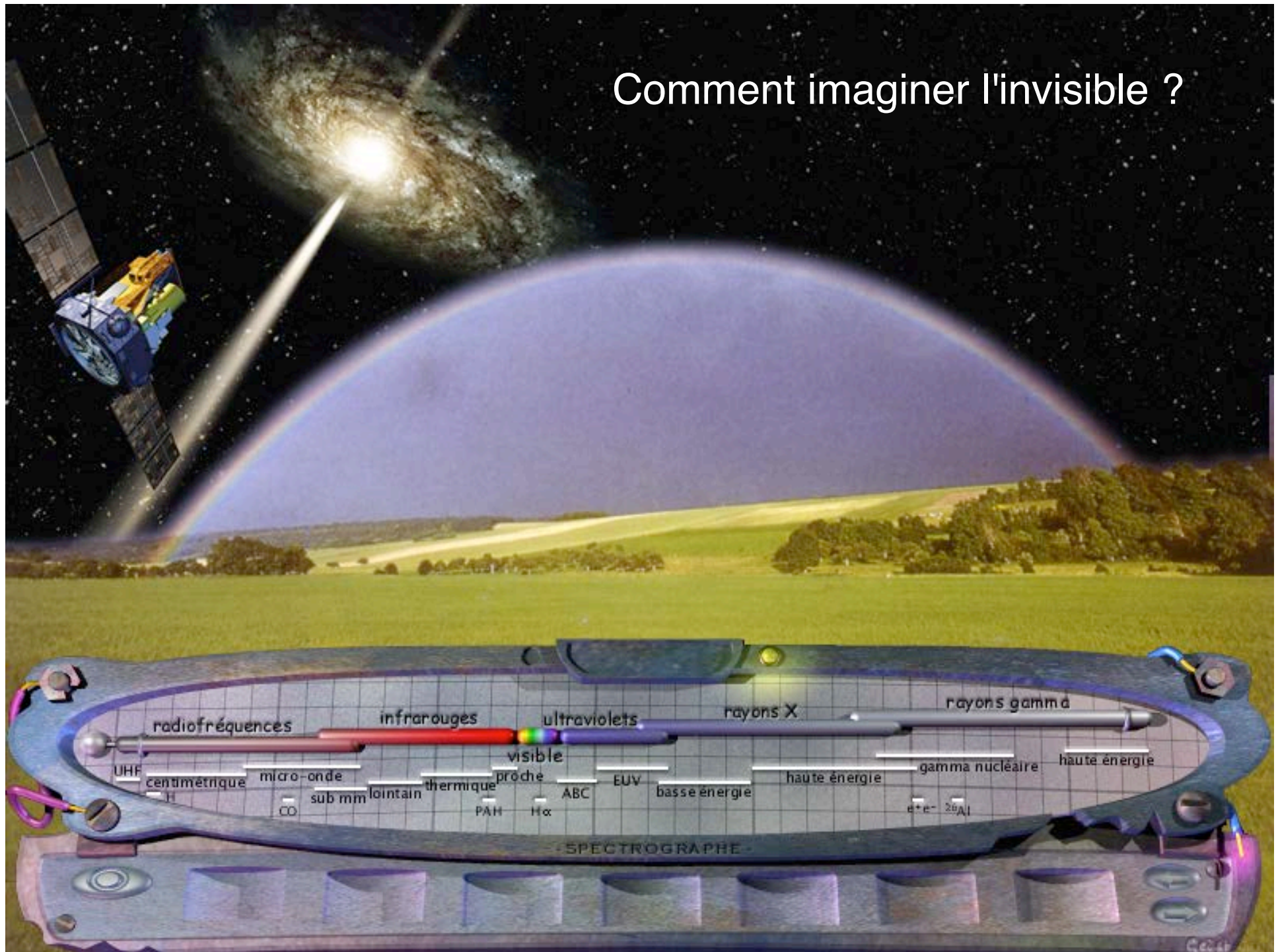
évolution stellaire
architecture de l'Univers
expansion de l'Univers
matière noire
exoplanètes
énergie sombre
etc ...



Au-delà de l'arc en ciel



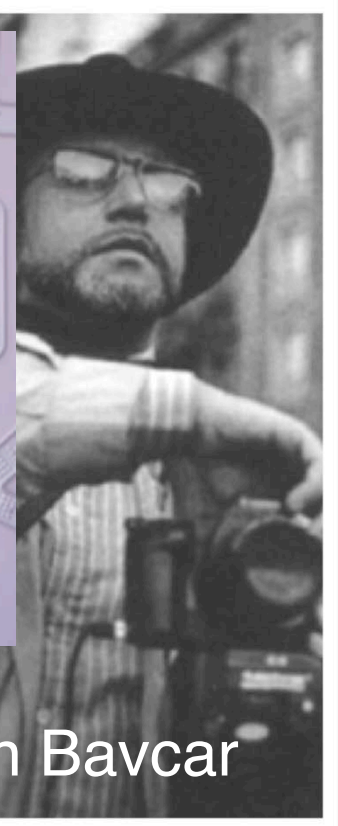
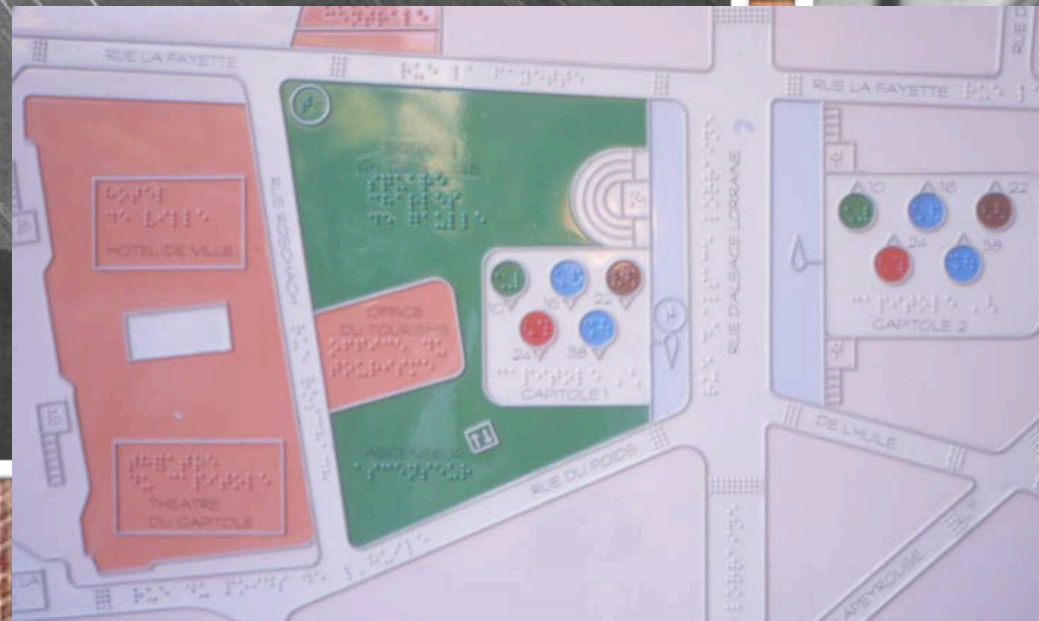
Comment imaginer l'invisible ?



Comment imaginer l'invisible ?

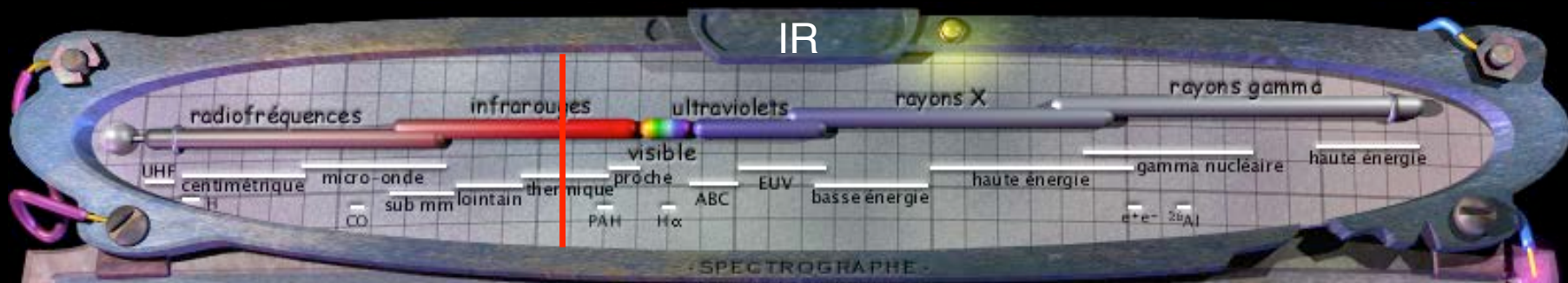
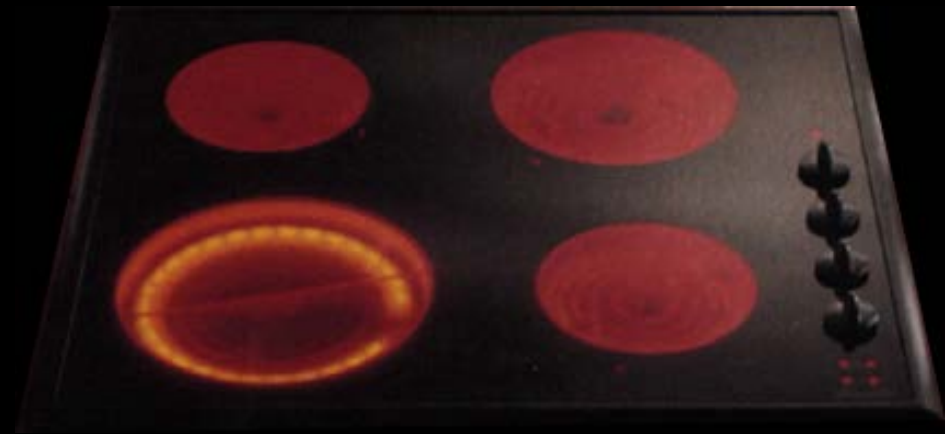
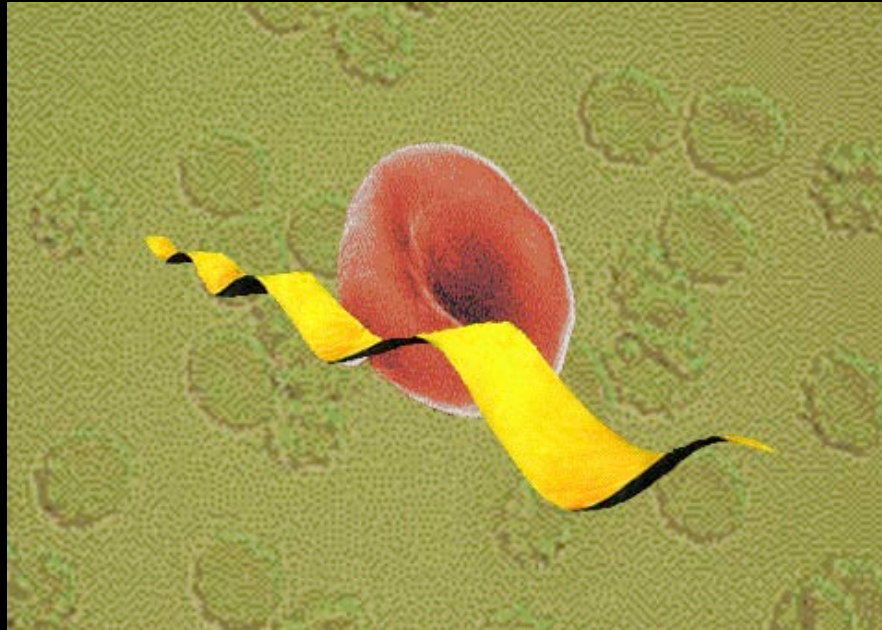


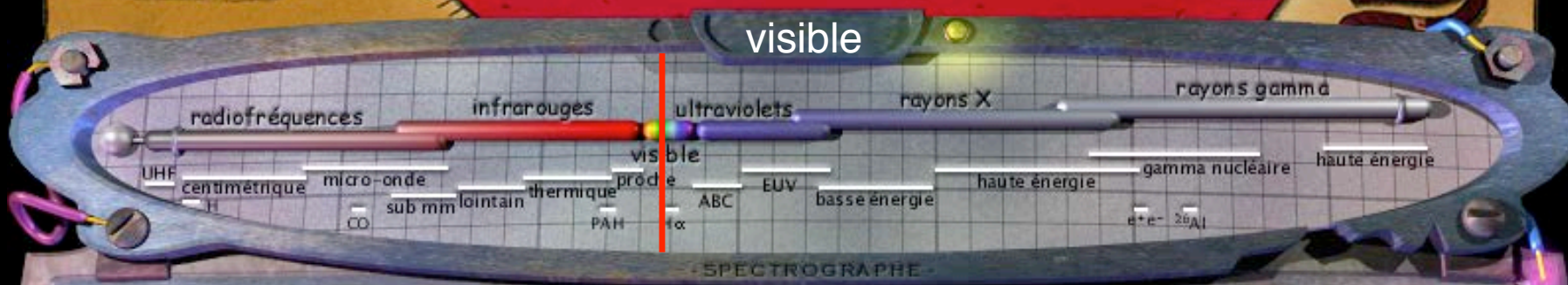
Comète

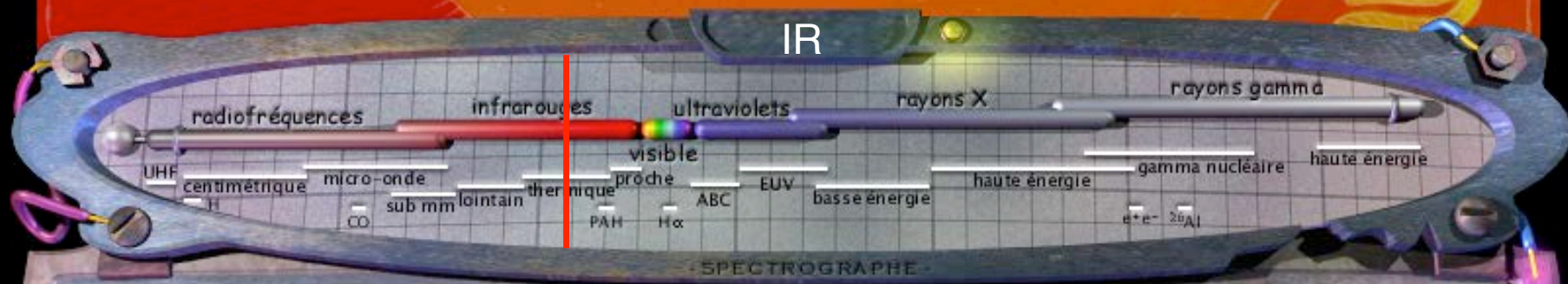


Evgen Bavcar

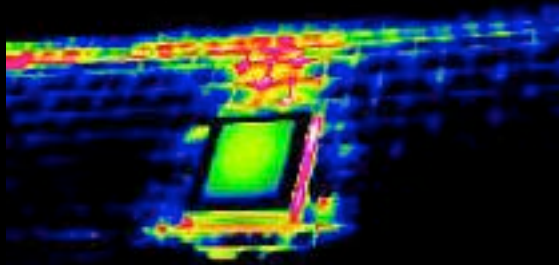
Plan de la station "Capitole" du Métro Toulousain



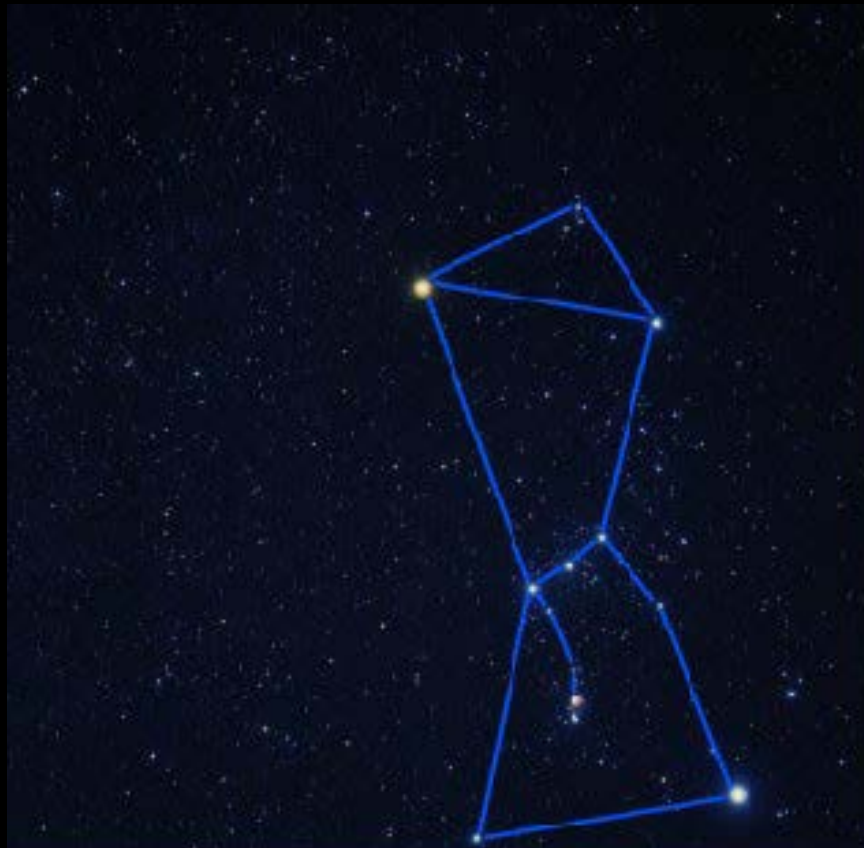




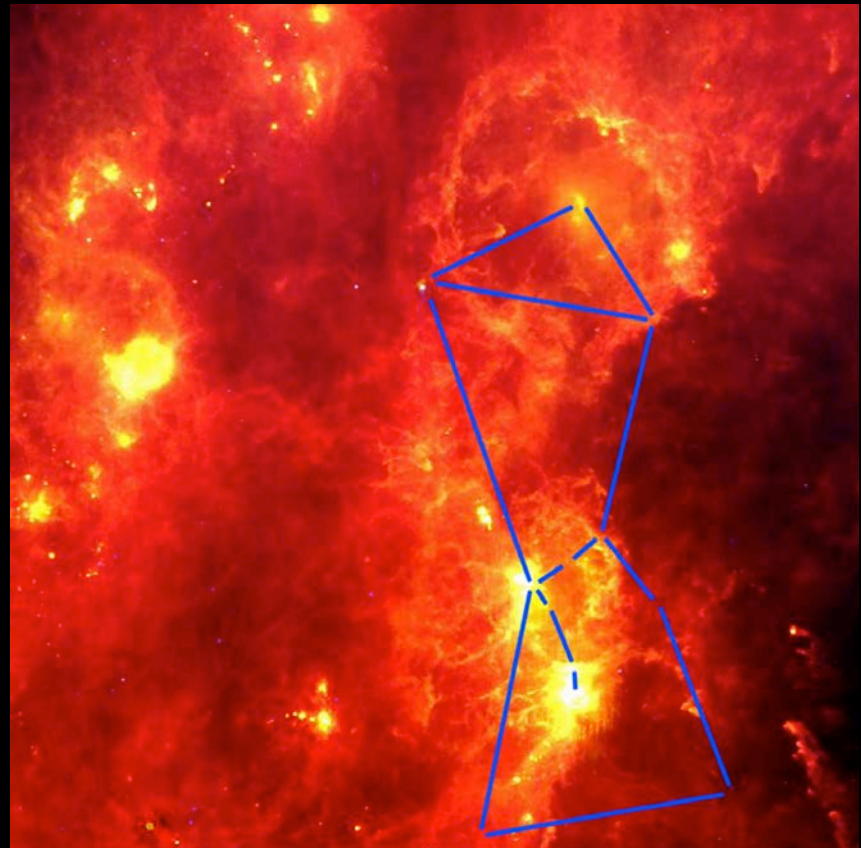
L'infrarouge – à quoi ça sert ?



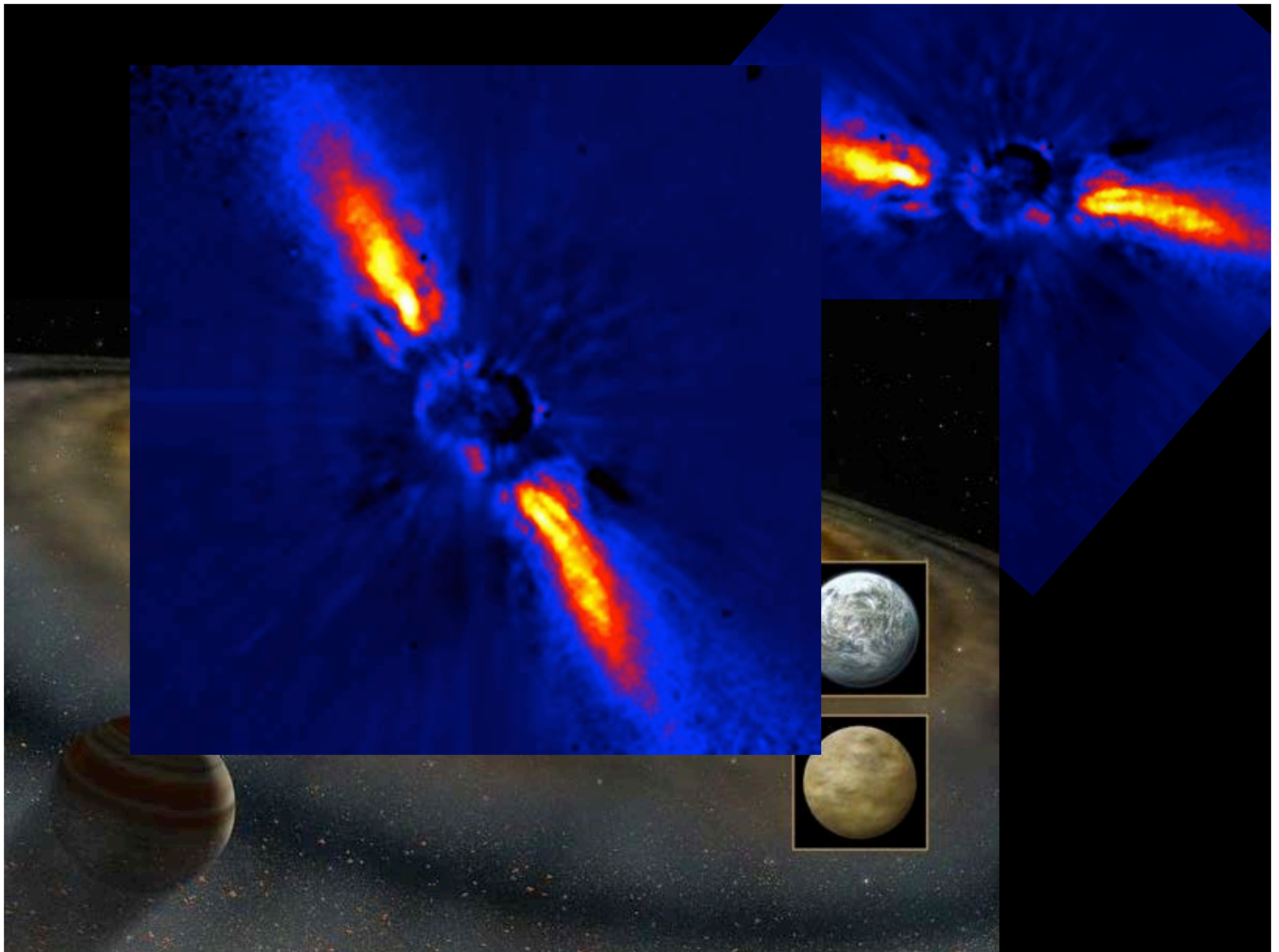
Orion

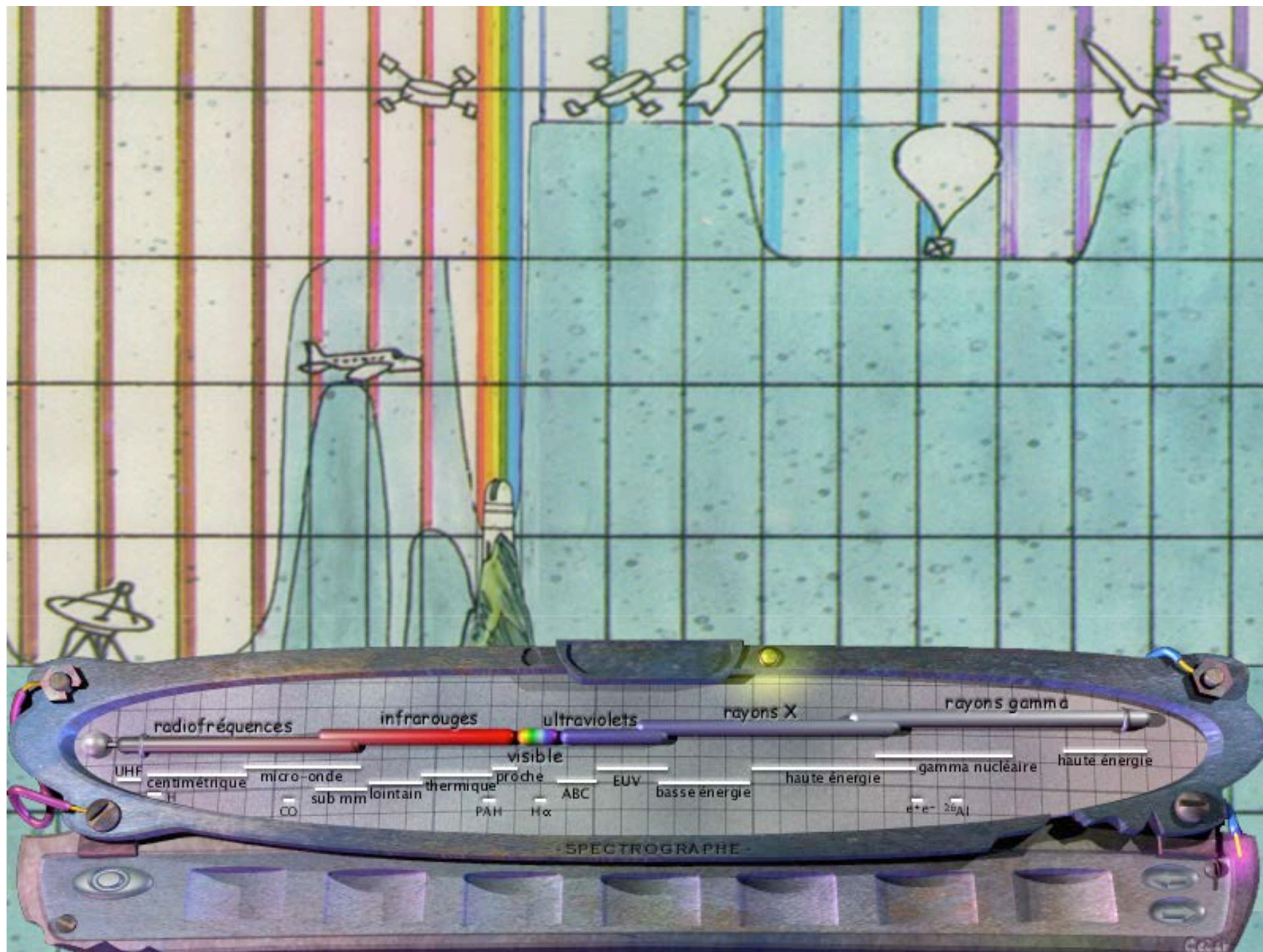


Visible



Infrarouge





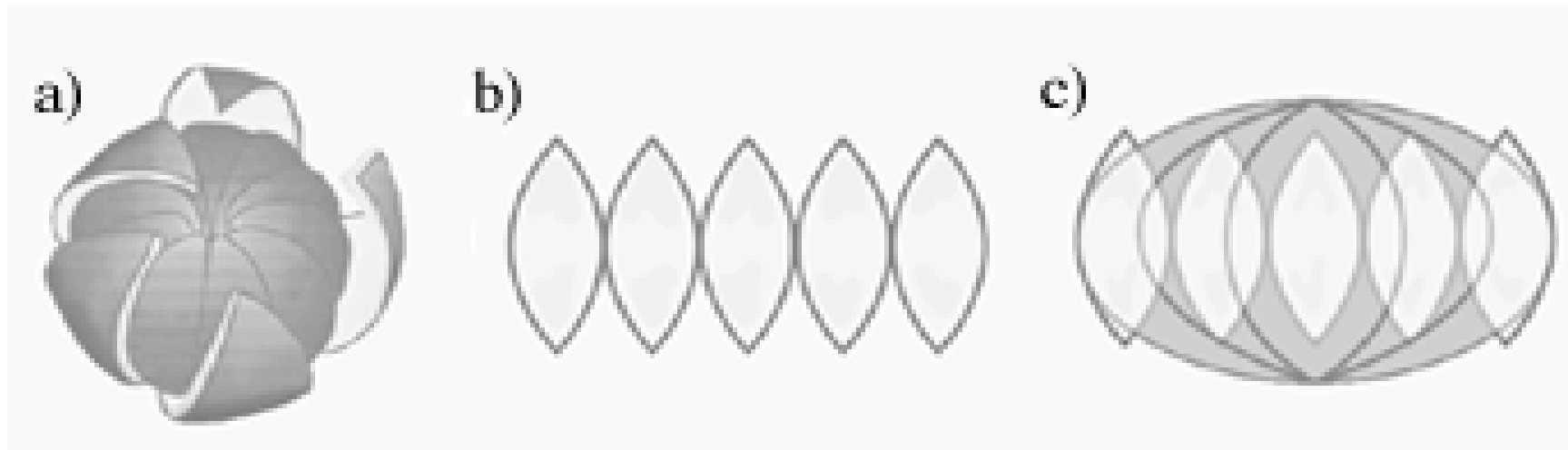
A detailed 3D rendering of the Herschel Space Telescope in space. The telescope is oriented diagonally, with its large, gold-colored primary mirror and secondary mirror assembly at the top. The main body of the telescope is a complex structure with various instruments and support systems visible. The background is a deep black space filled with numerous small, distant stars. A bright, glowing sun or star is visible in the upper right quadrant, casting a soft light on the telescope's surfaces.

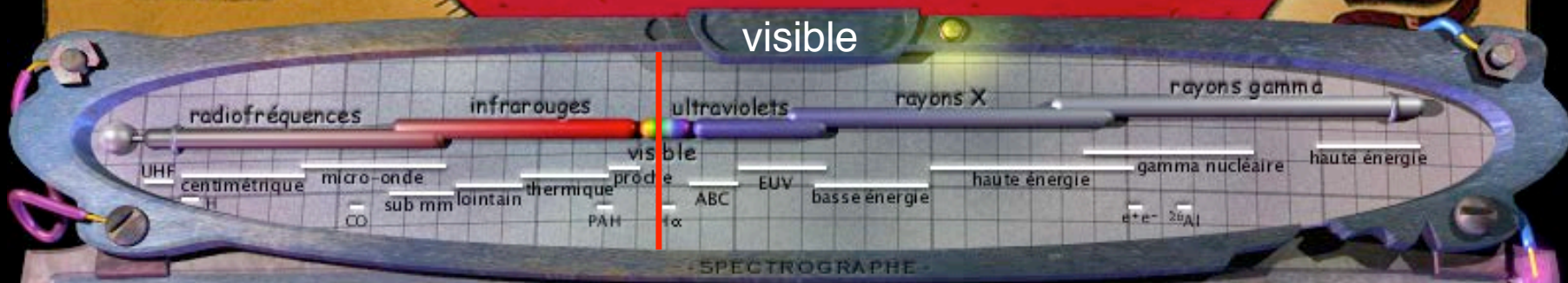
HERSCHEL
lancé le 14 mai 2009

disques protoplanétaires
molécules ... organiques
Galaxies infrarouges
masers ...



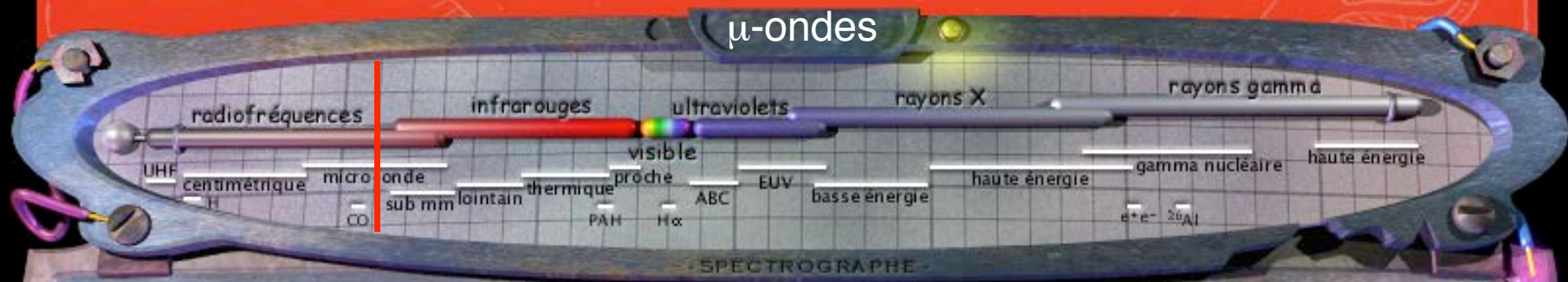
Comment comprendre un ciel "oval" ?



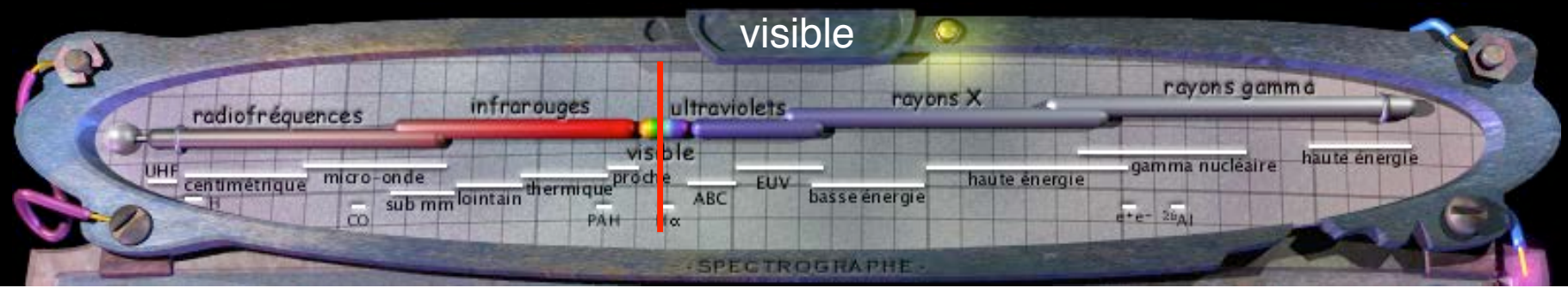
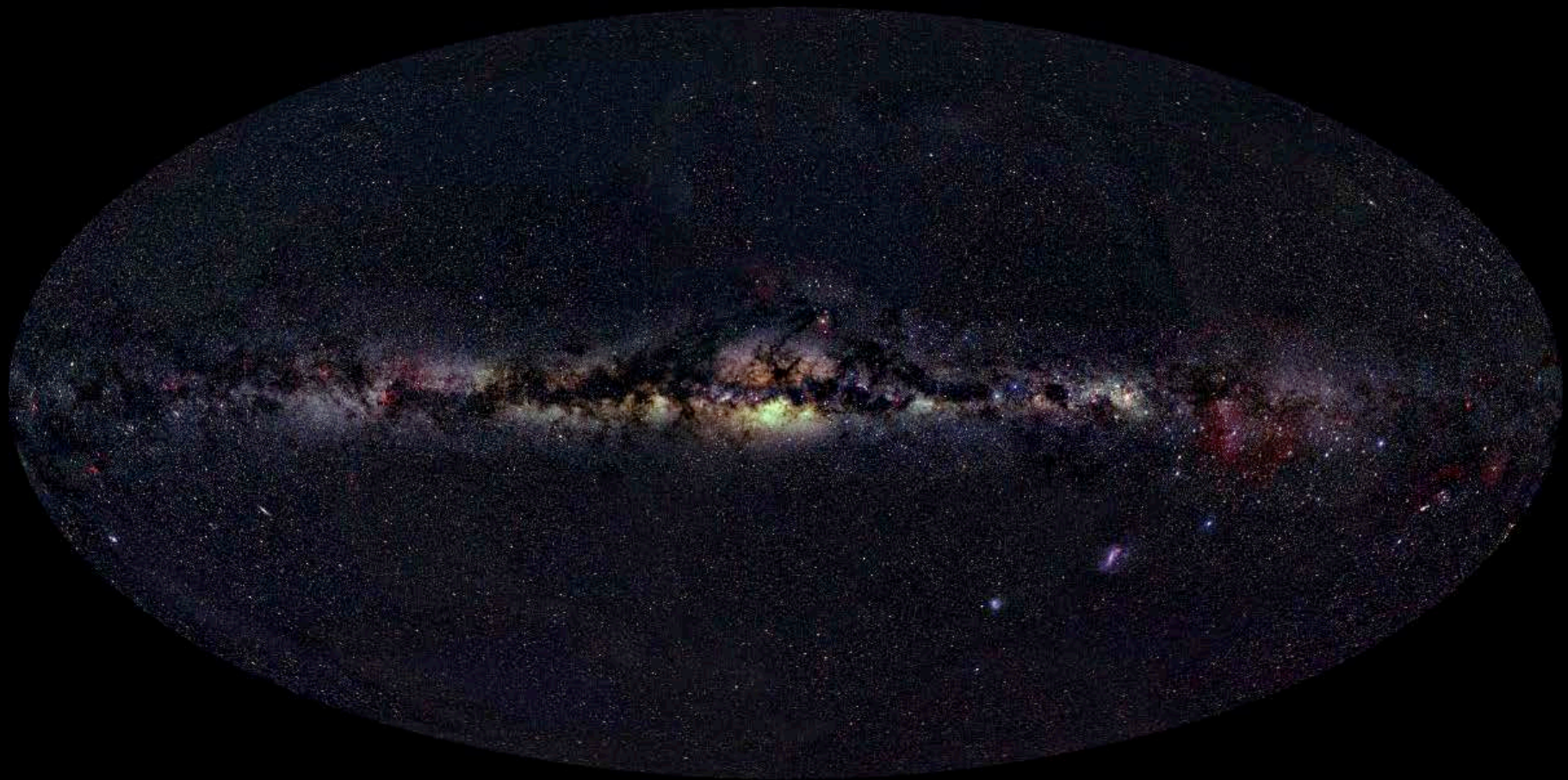




μ -ondes





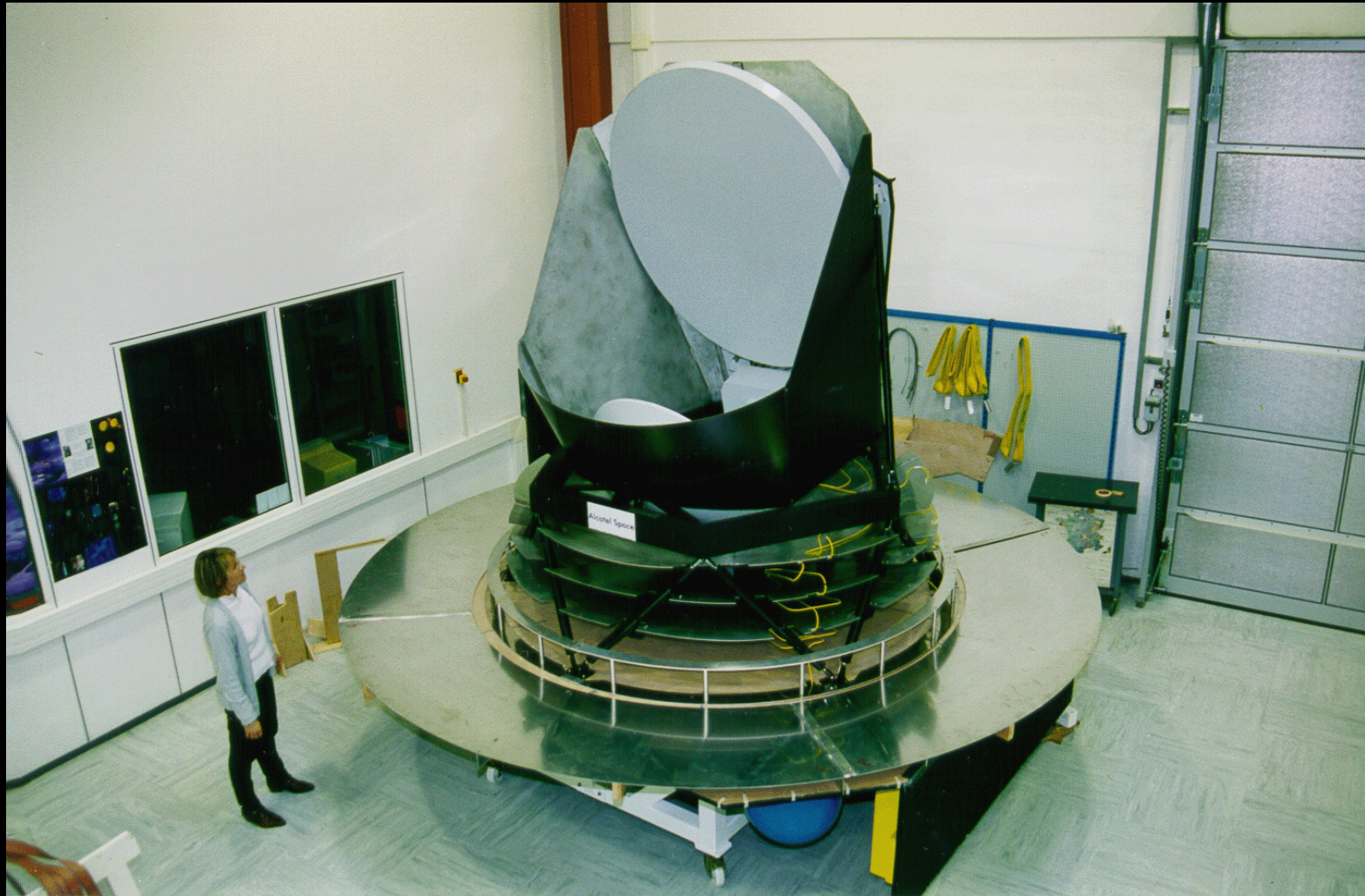


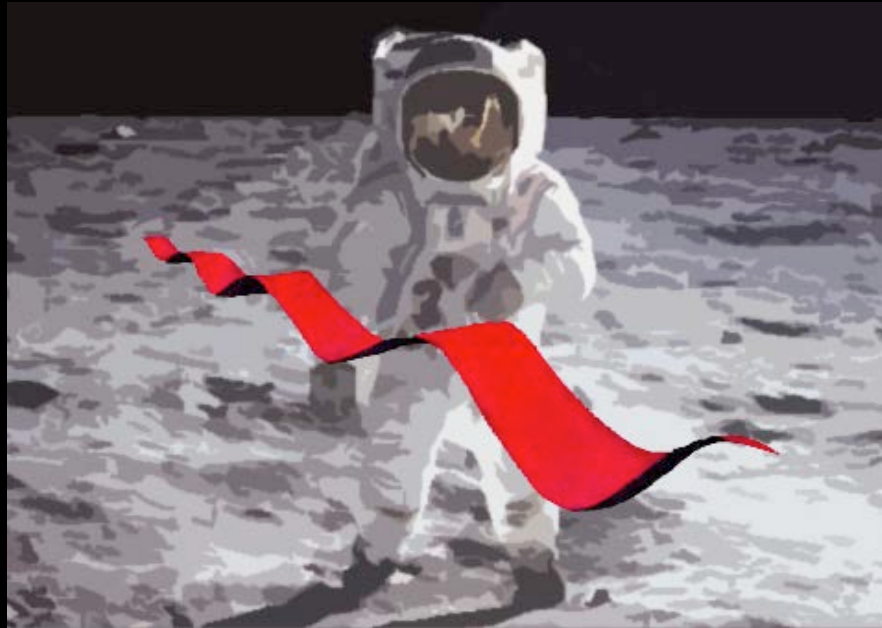
fond cosmologique
age précis de l'Univers
geometrie de l'Univers

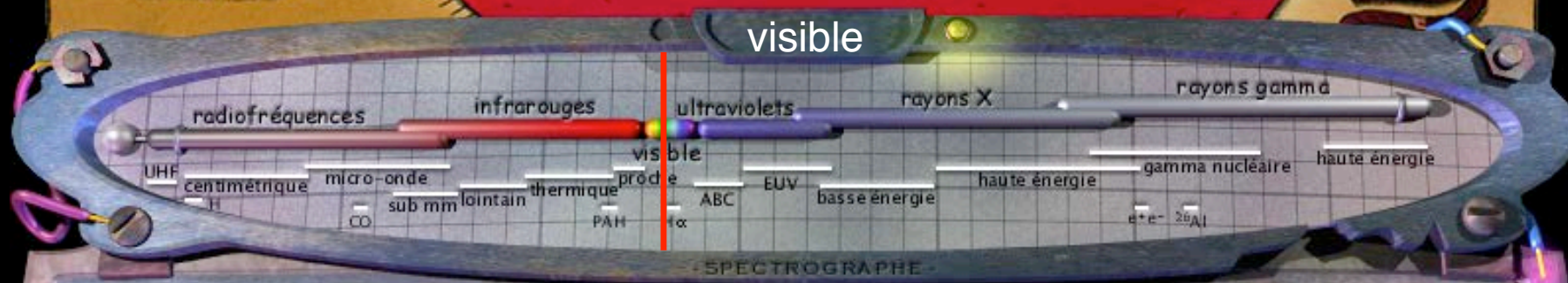
L'Univers a 13.8 Milliards d'années



Planck : lancé le 14 mai 2009









radio



VLA = Very Large Array (1980) New Mexico

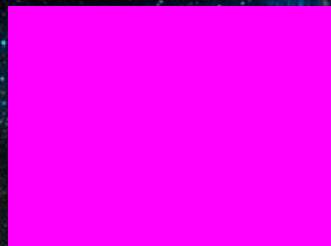


matrice de 27-antennes



le reste de
supernova de la Vela

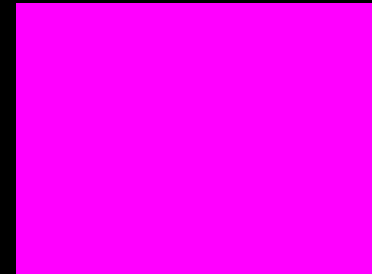
digitized sky survey



CP 0834



- diamètre ~ 15 km
- masse ~ 1 $M_{\odot}$



P 0950



B0329



pulsar de la Vela



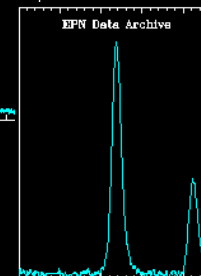
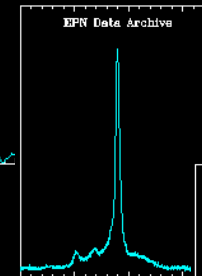
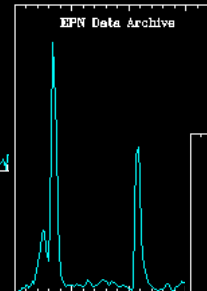
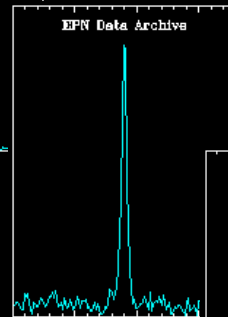
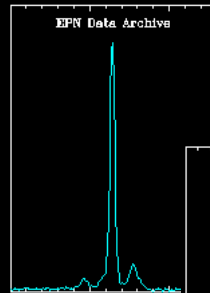
pulsar du Crabe



PSR J0437-4715

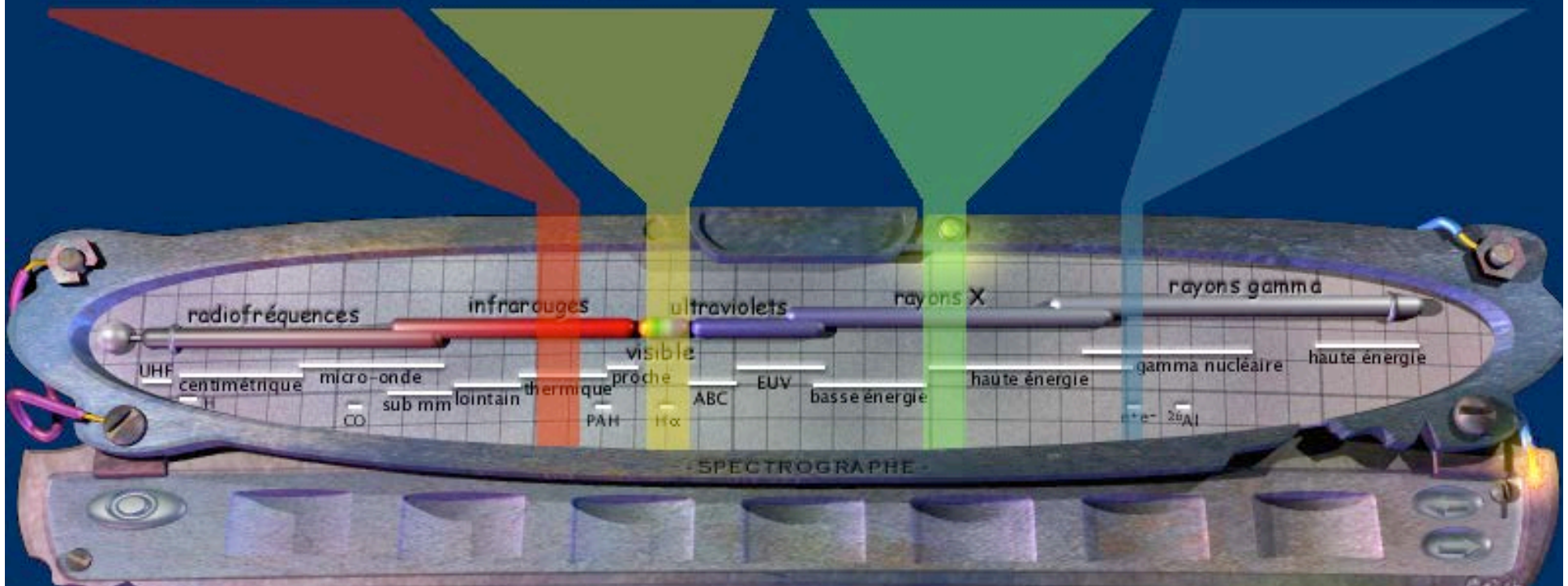
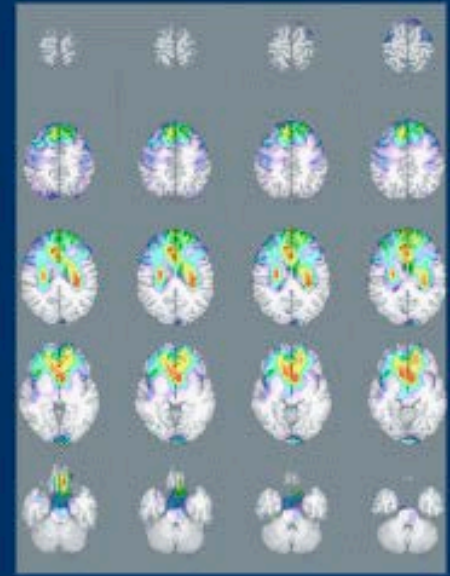


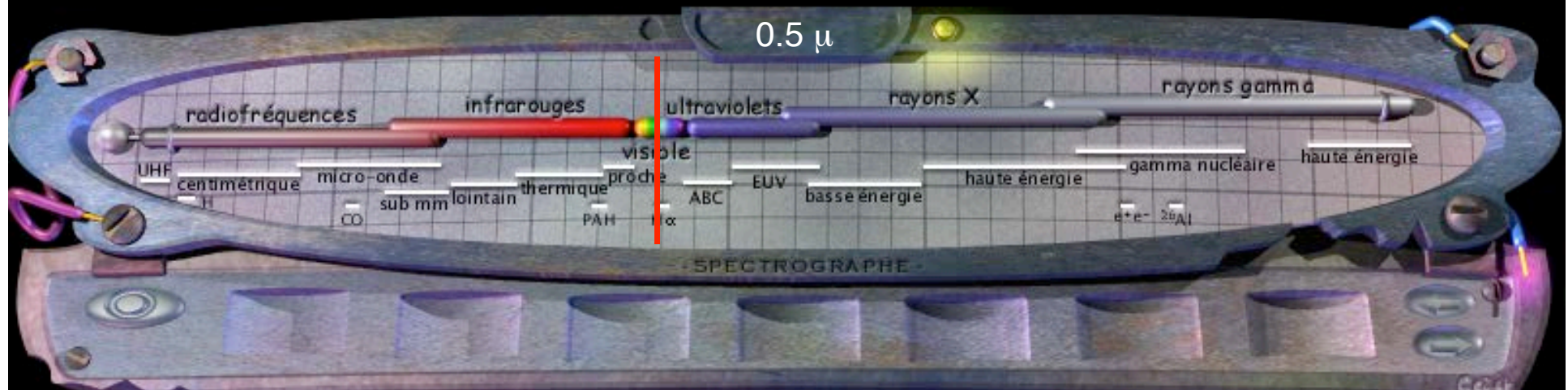
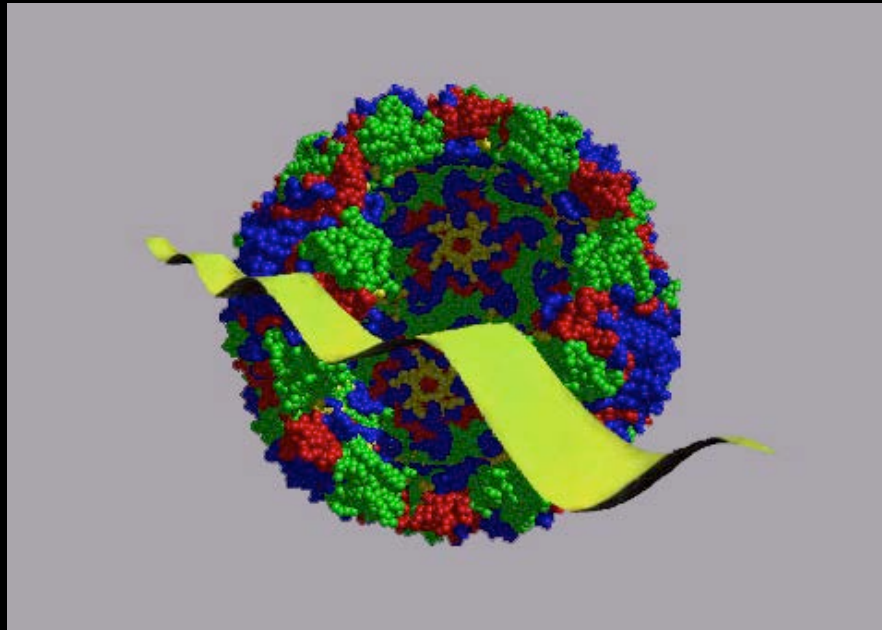
PSR B1937+21

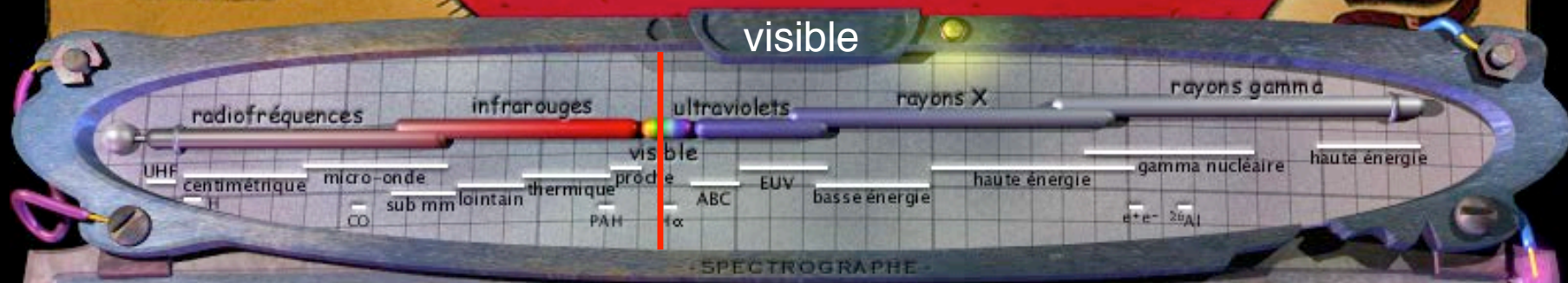


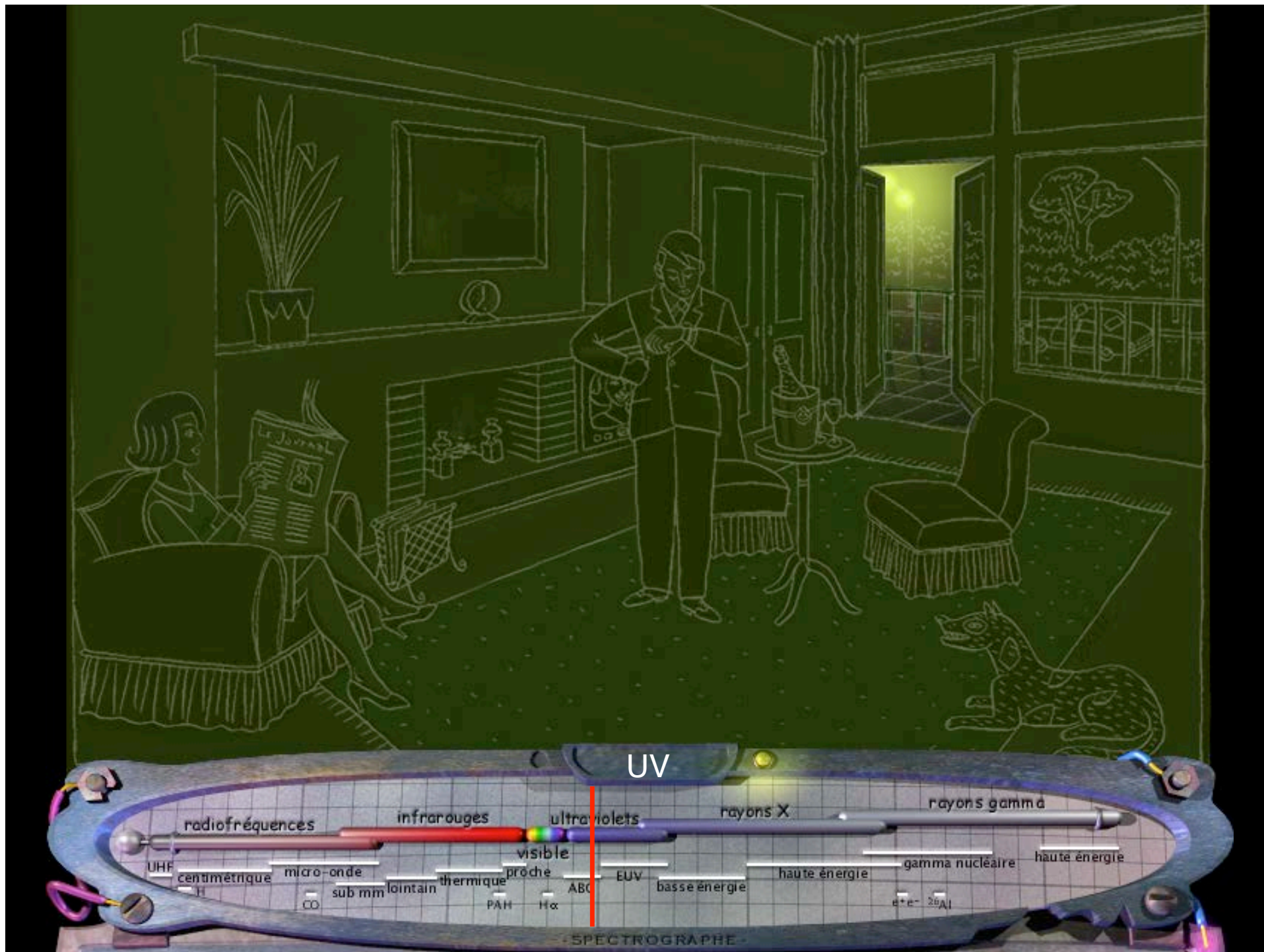
matière neutronique
structure de la Galaxie
quasars
ondes gravitationnelles
etc

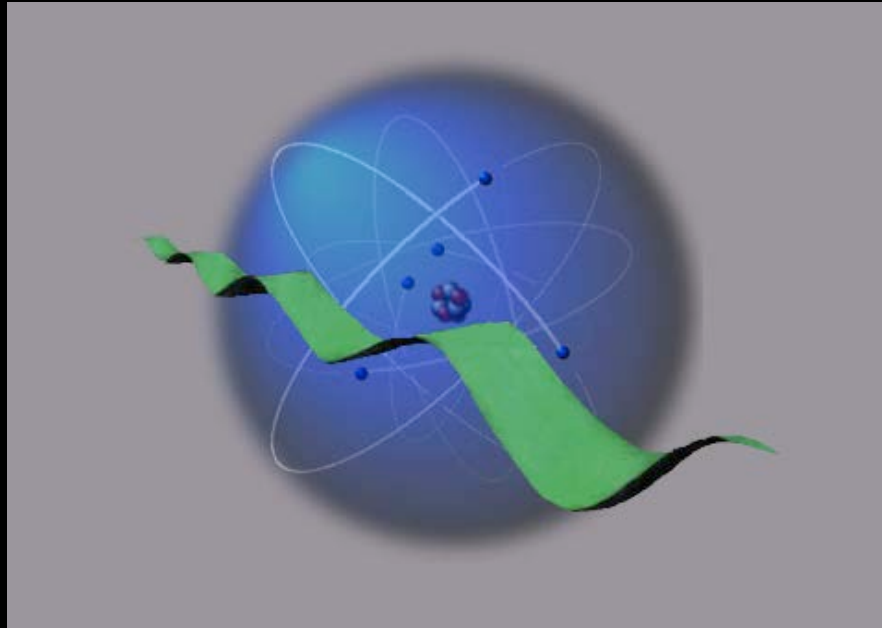


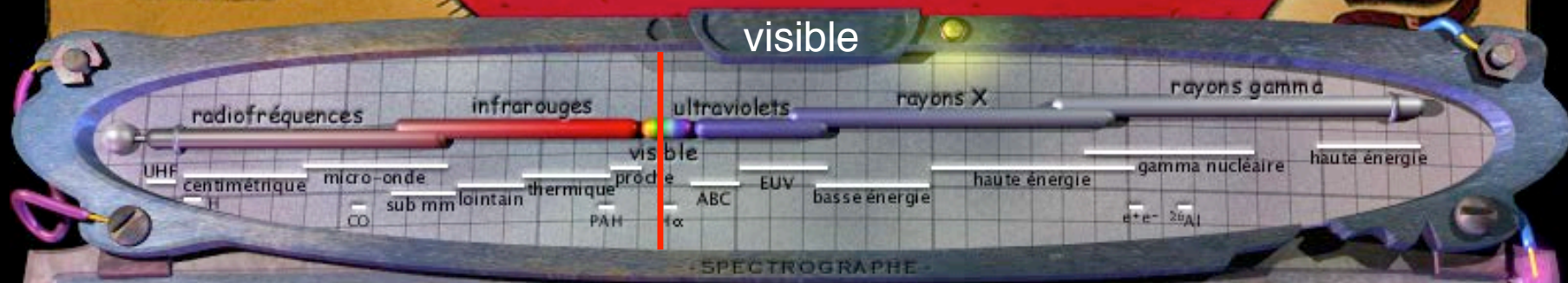


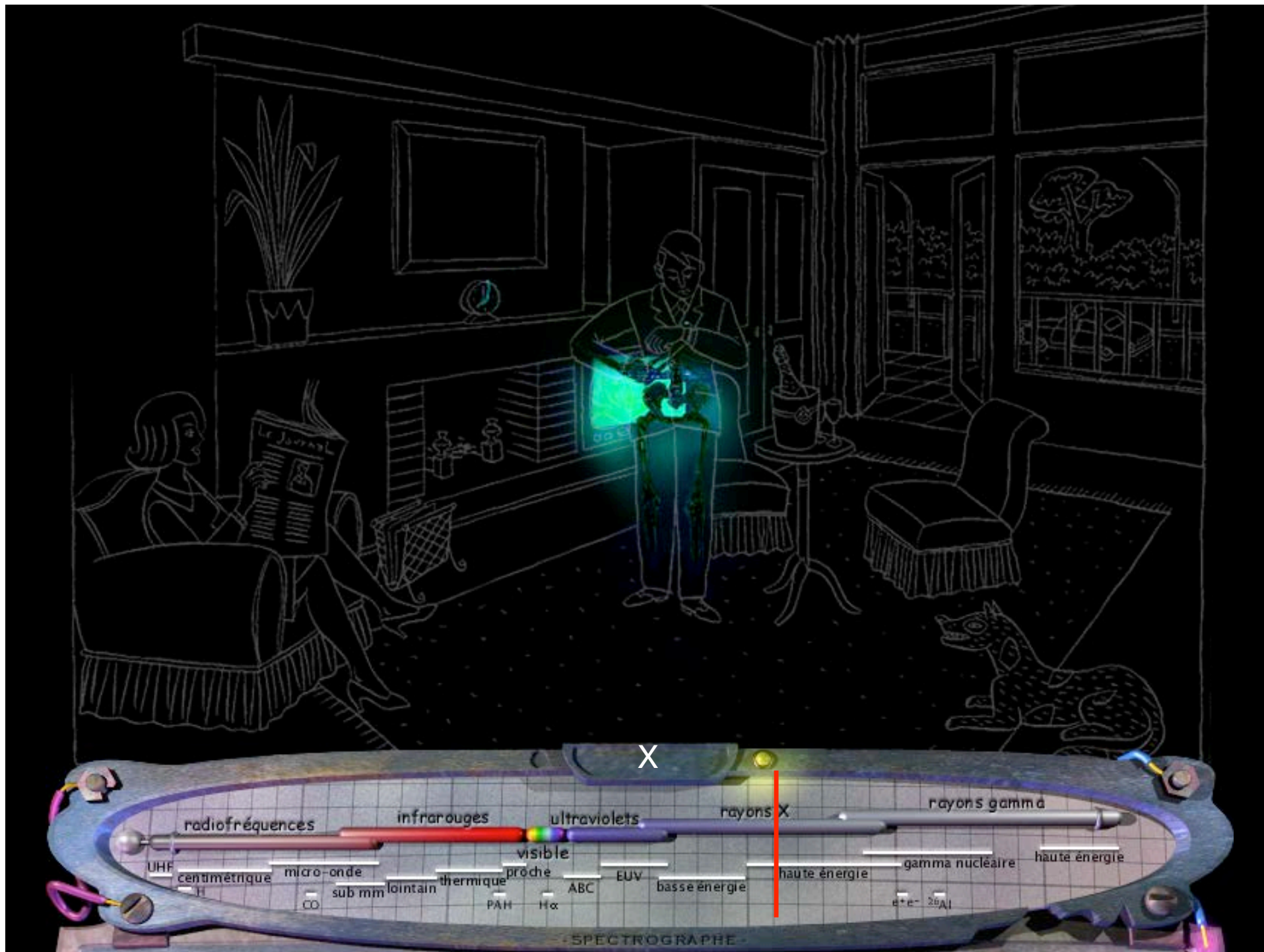




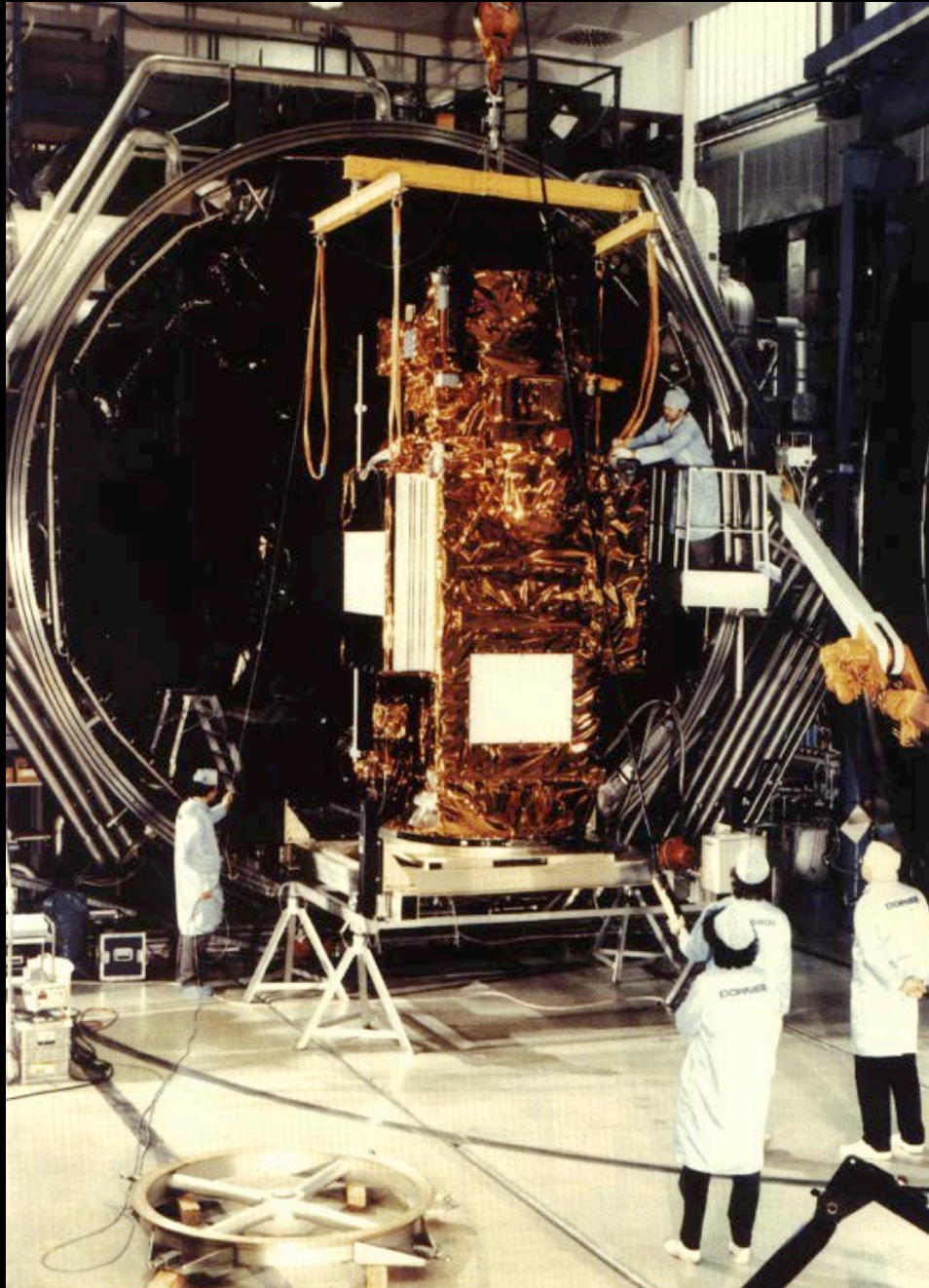






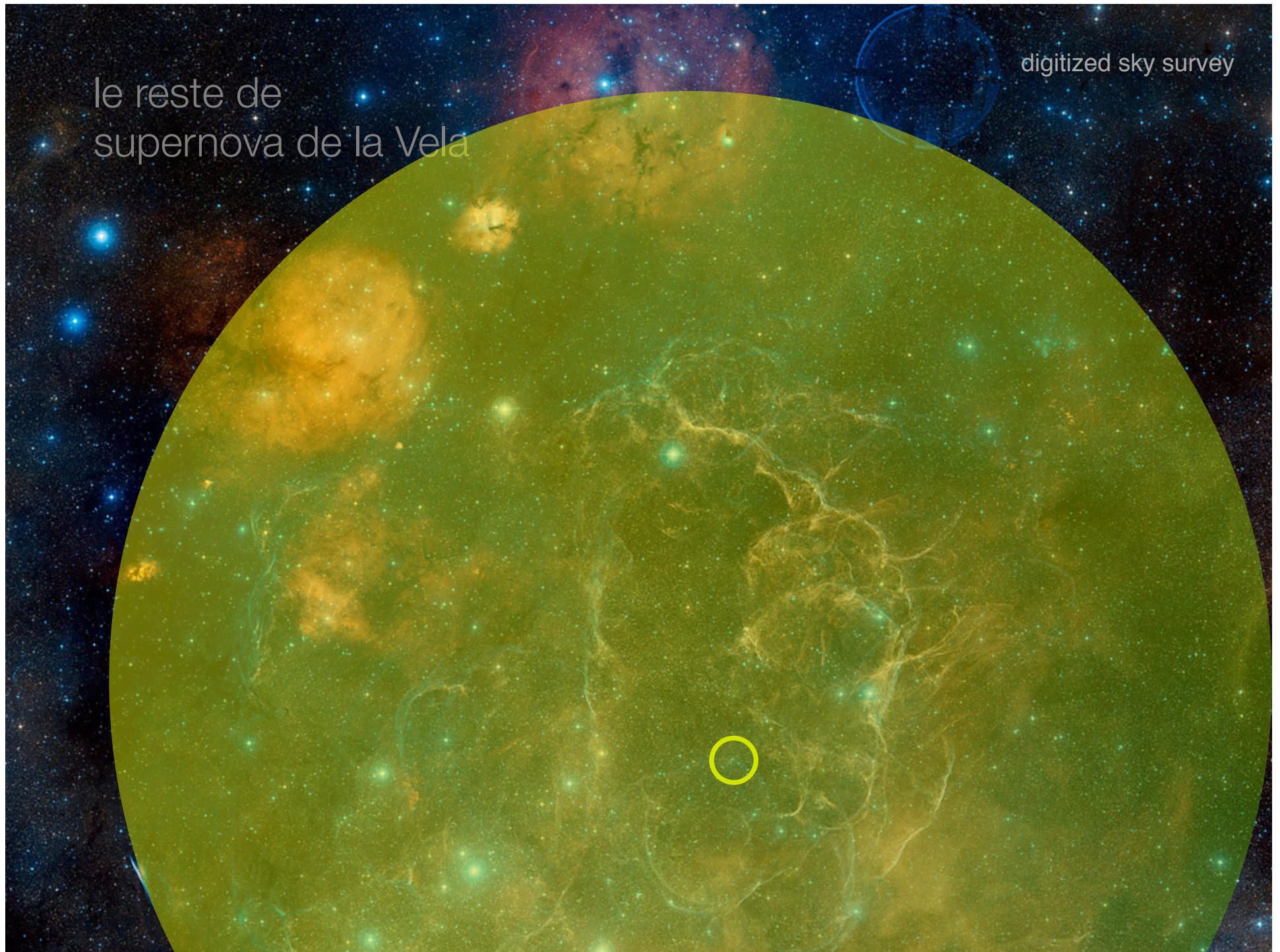


ROSAT



le reste de
supernova de la Vela

digitized sky survey



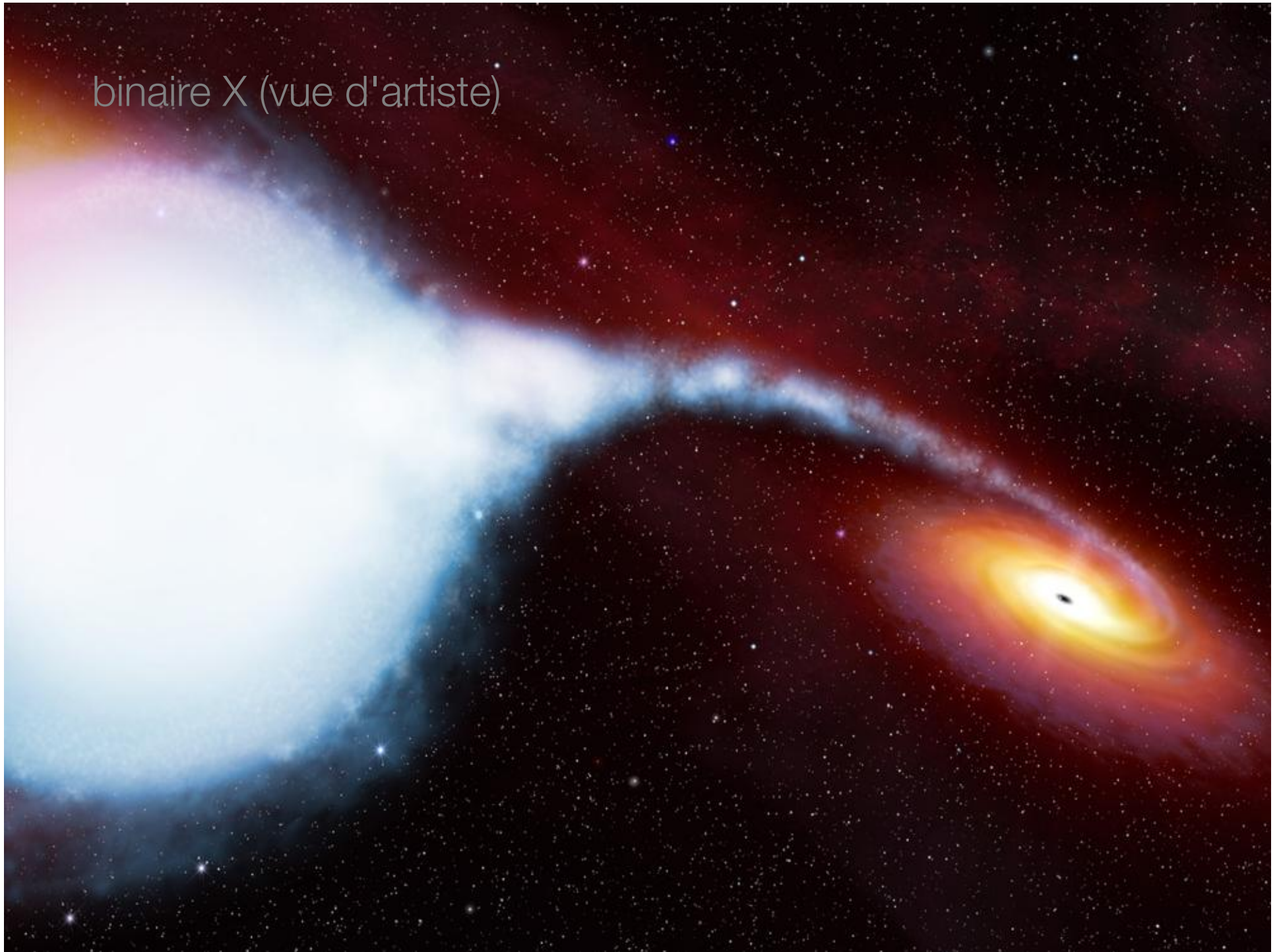
disques et jets
trous noirs
gaz chaud ds amas de gal.

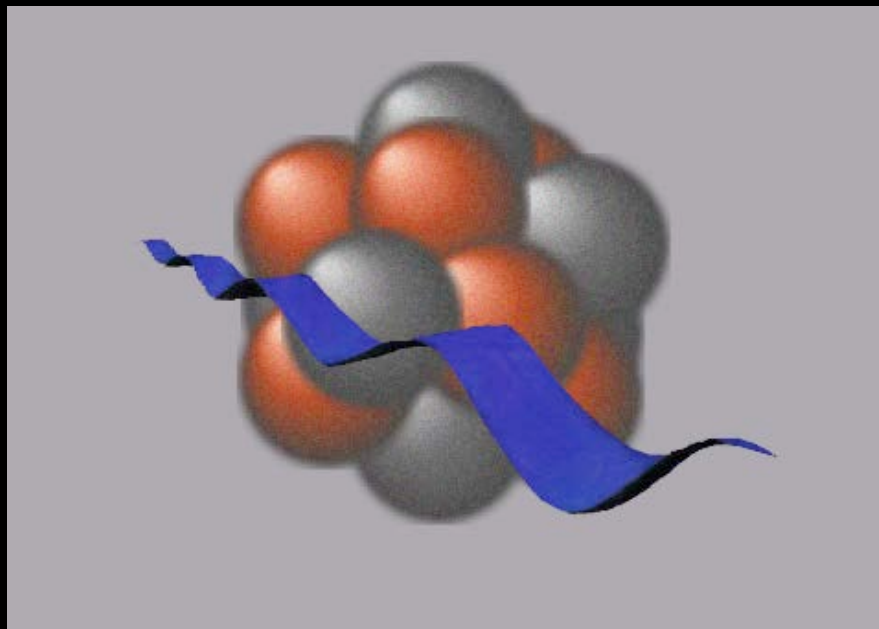


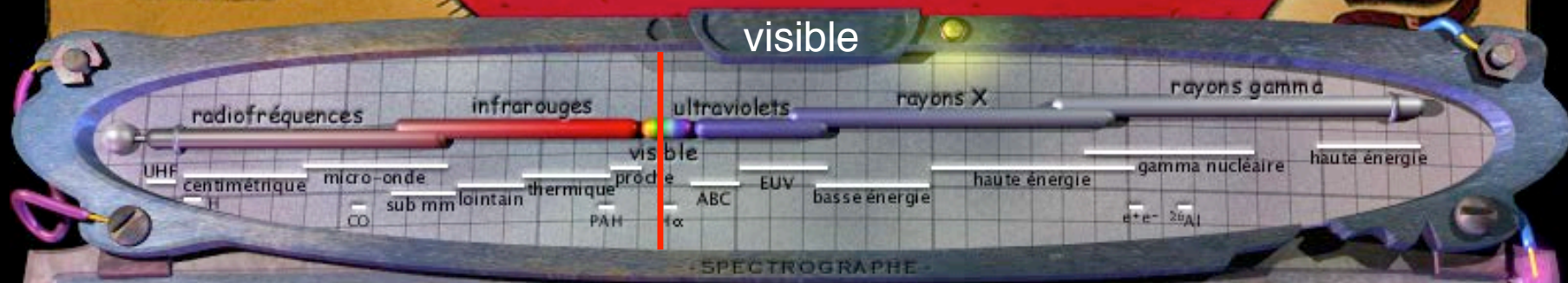
INTEGRAL – lancé le 17 oct 2002



binaire X (vue d'artiste)

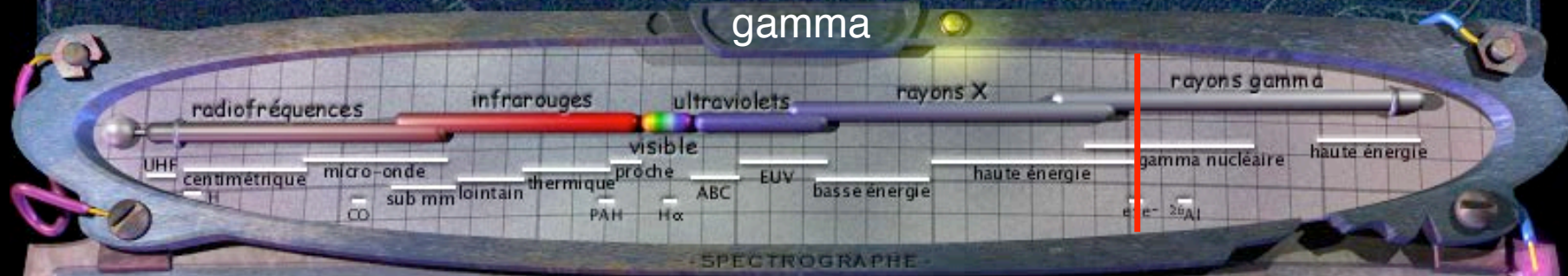






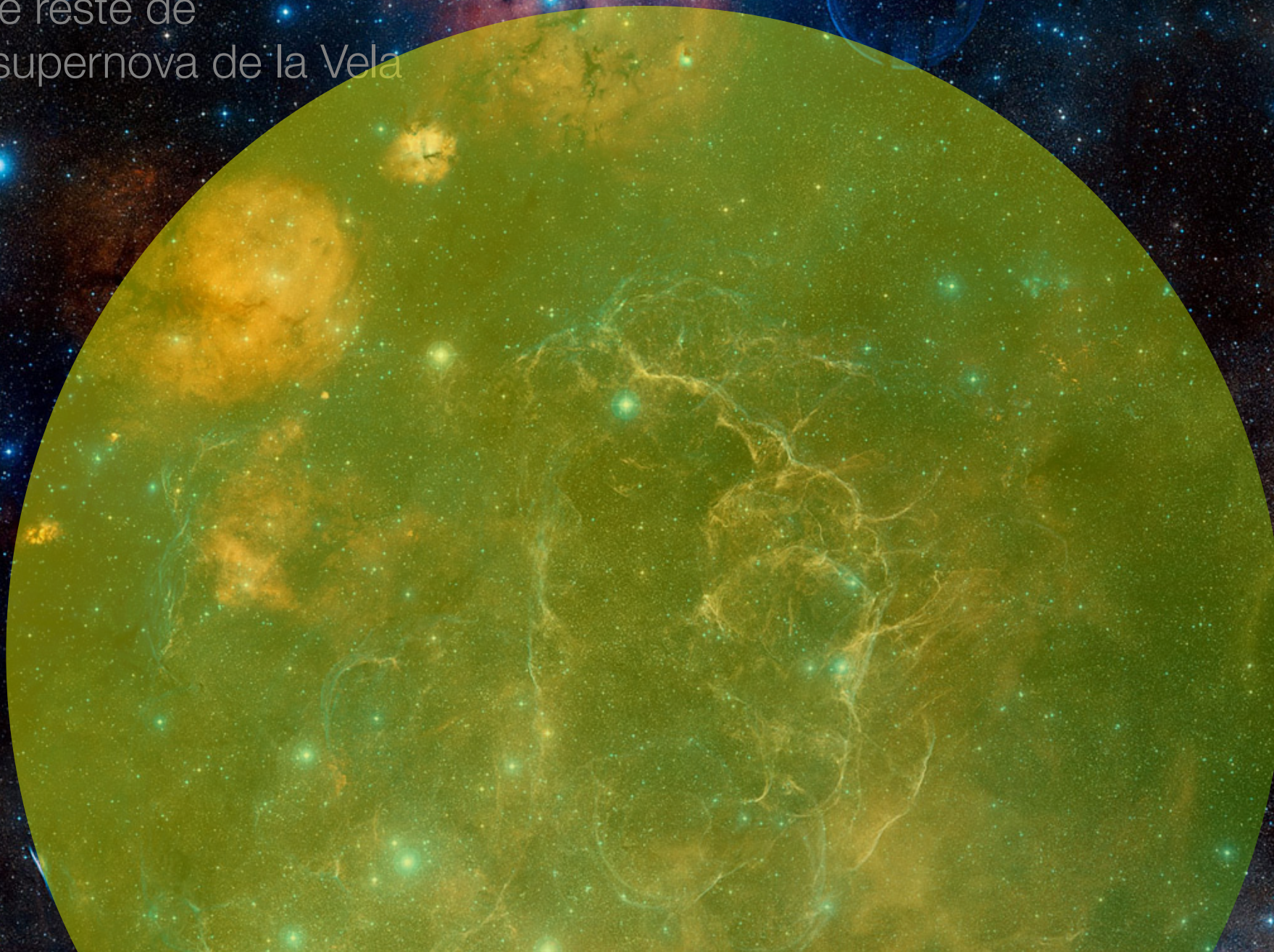


gamma



le reste de
supernova de la Vela

digitized sky survey



les éléments chimiques

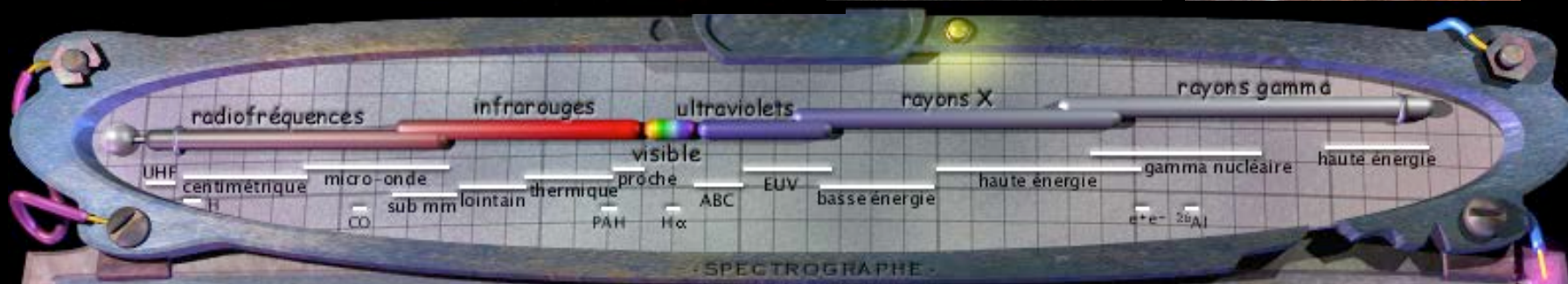
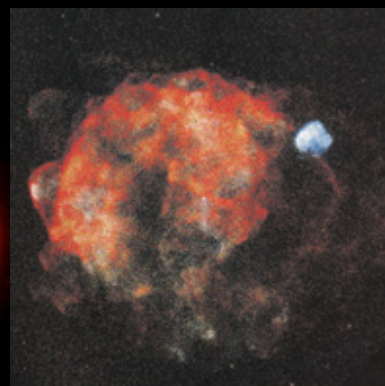
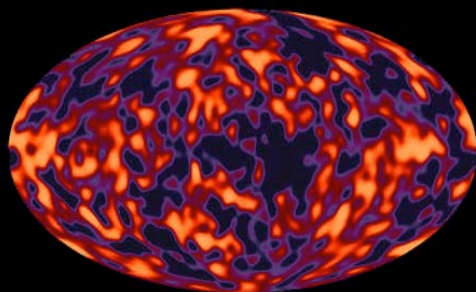
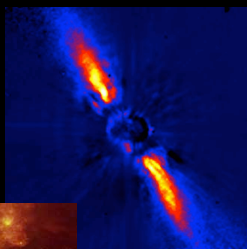
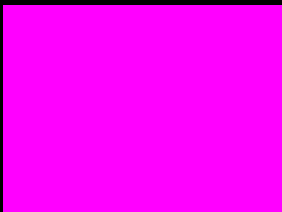


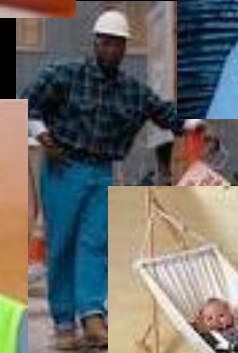
évolution stellaire - le cycle de la matière



radioactivité
sursauts gamma
annihilation e^-e^+
magnetars ...







le cycle de la matière



video

L'inimaginable naissance

Biau, Gros-Jean, von Ballmoos

DVD disponible :

CNES

Direction de la Communication Externe

18 avenue Edouard Belin

31401 TOULOUSE CEDEX 9