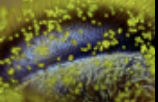
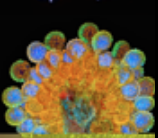
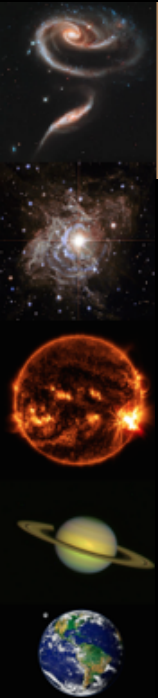


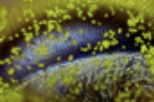
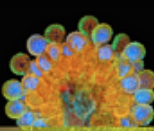
TROUS NOIRS SUPERMASSIFS DES OGRES CACHÉS

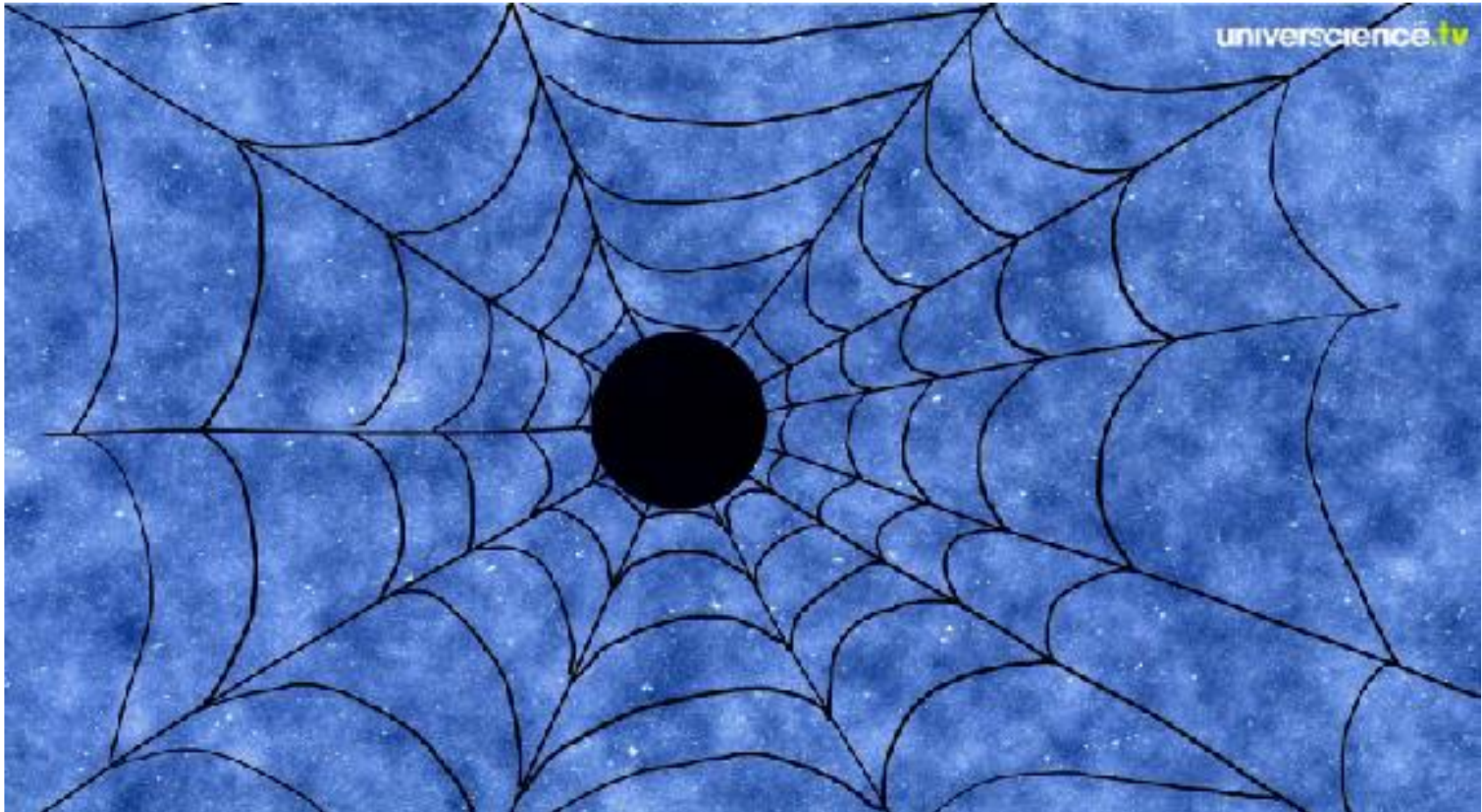


Club Astro - Saint Joseph Gaillac

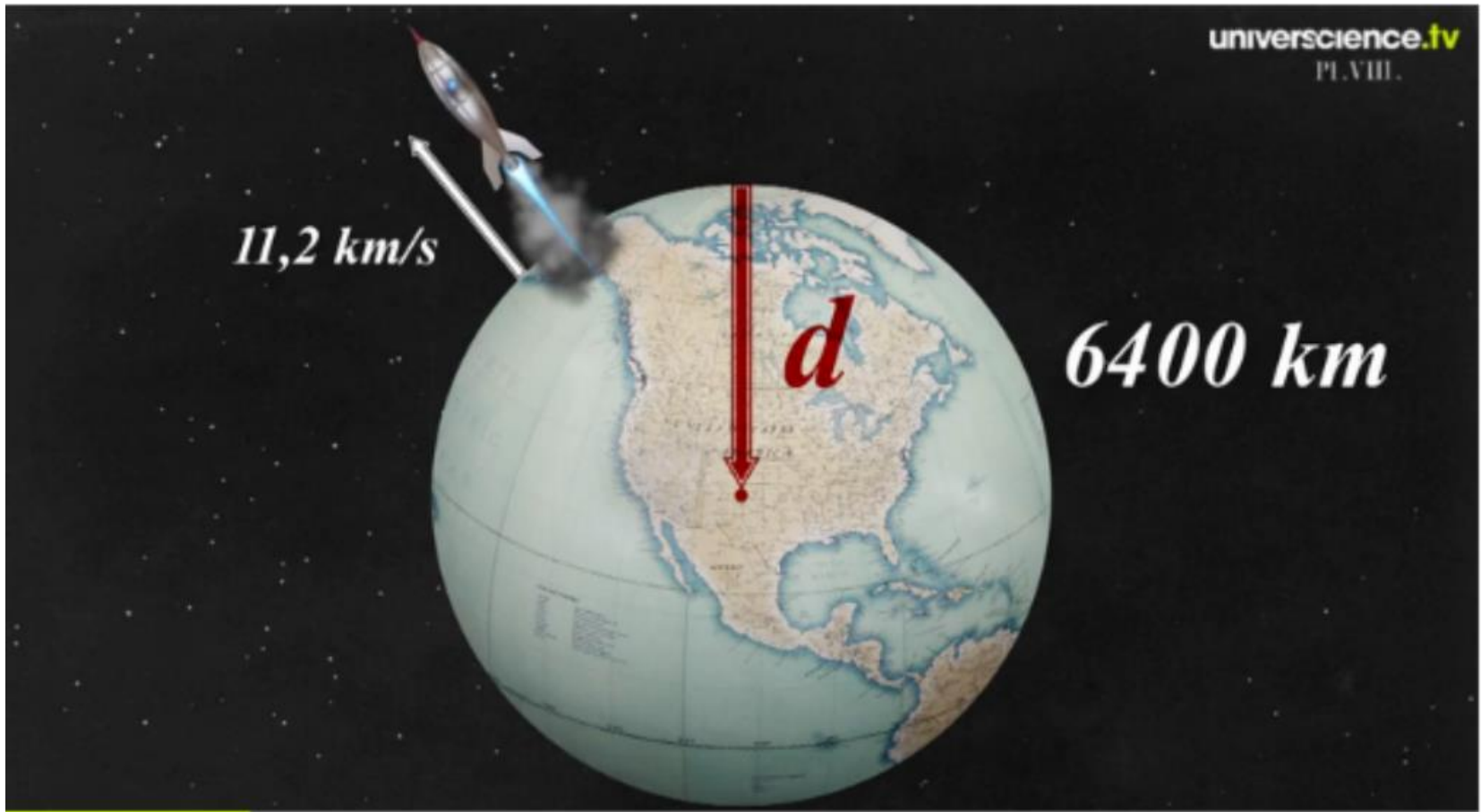




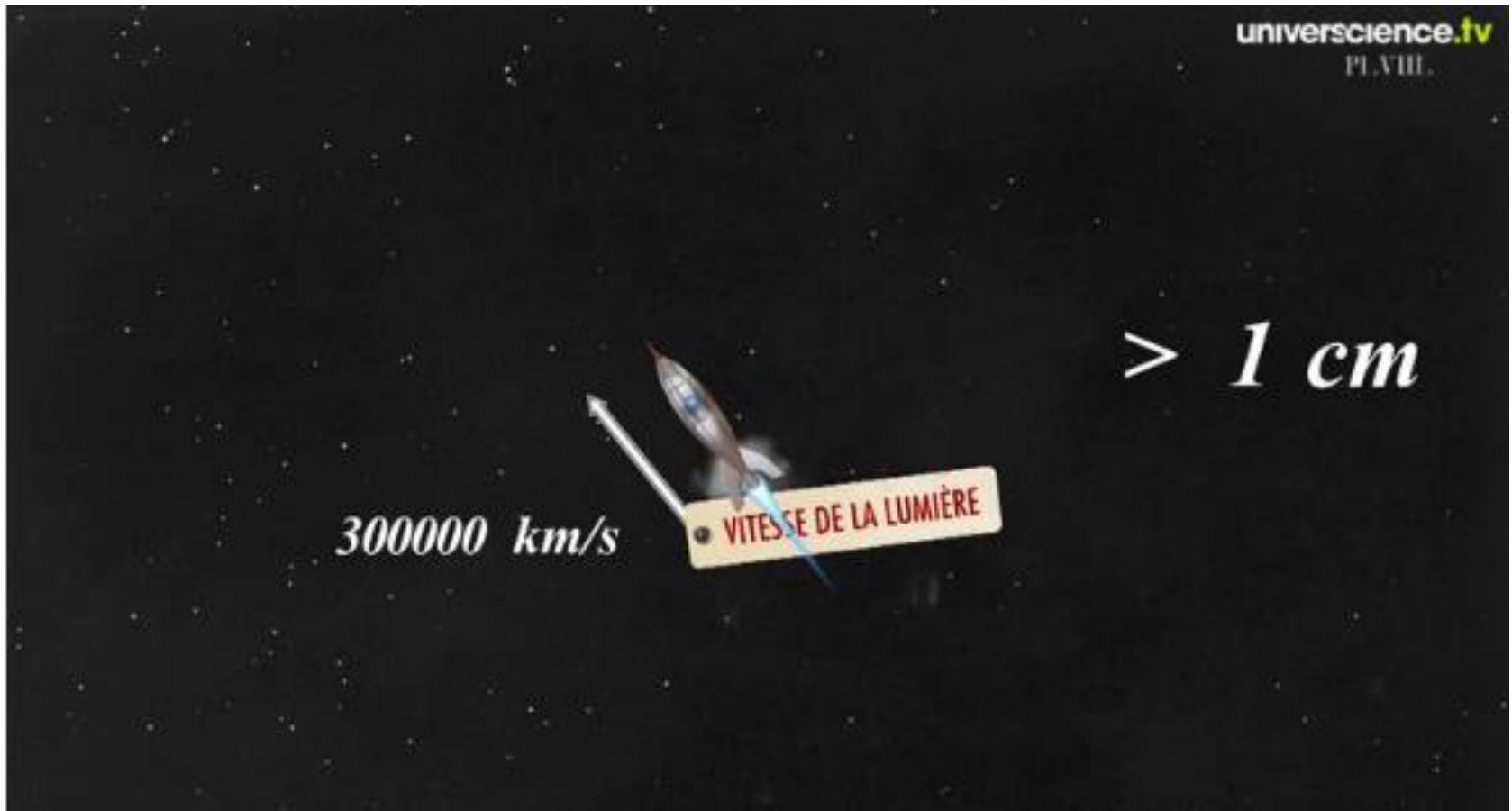




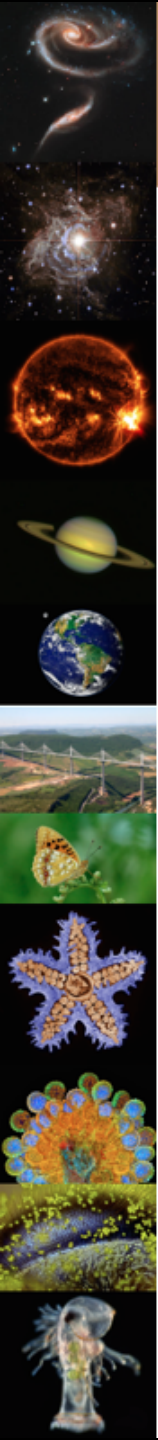
<http://www.universcience.tv/video-les-trous-noirs-sont-ils-des-ogres-10313.html>



<http://www.universcience.tv/video-qu-est-ce-qu-un-trou-noir-5748.html>



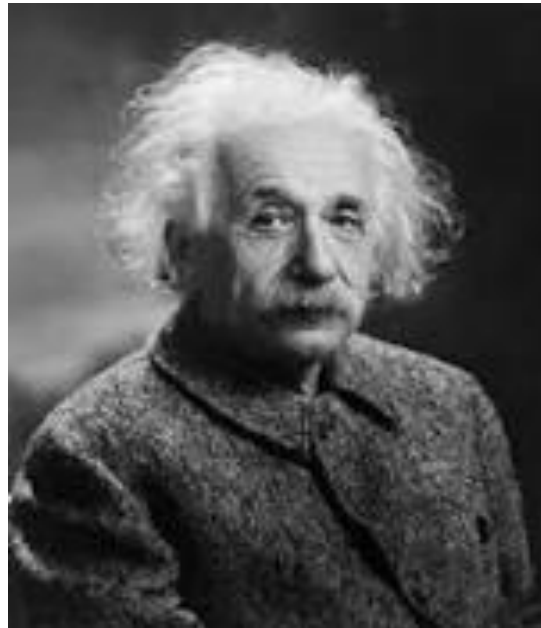
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1763
John Mitchell

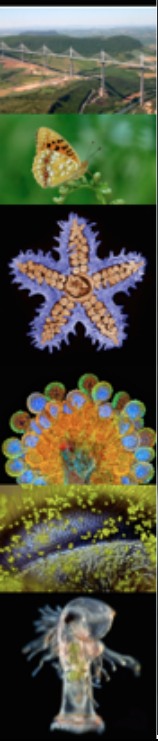


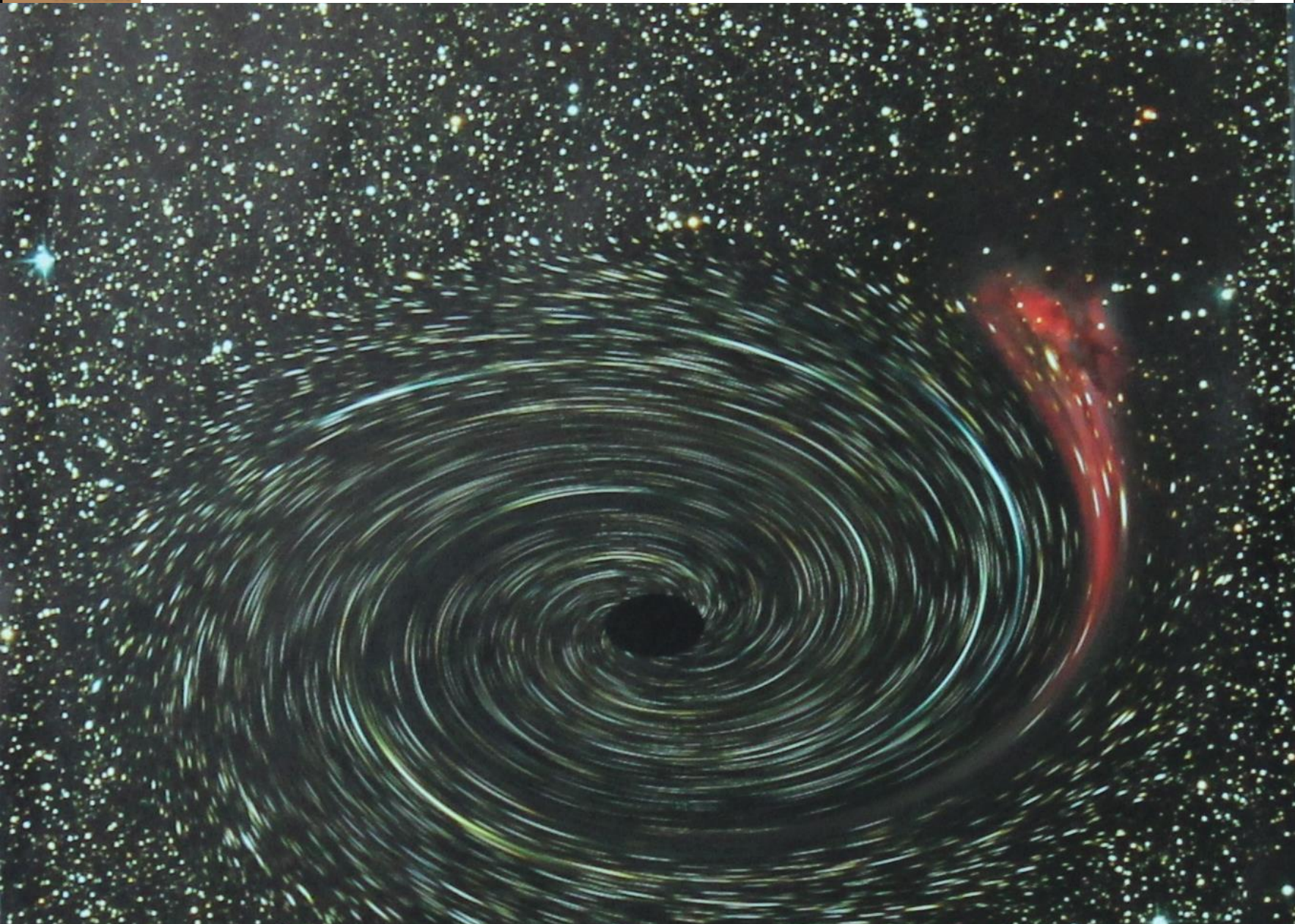
1916
Karl
Schwarzschild

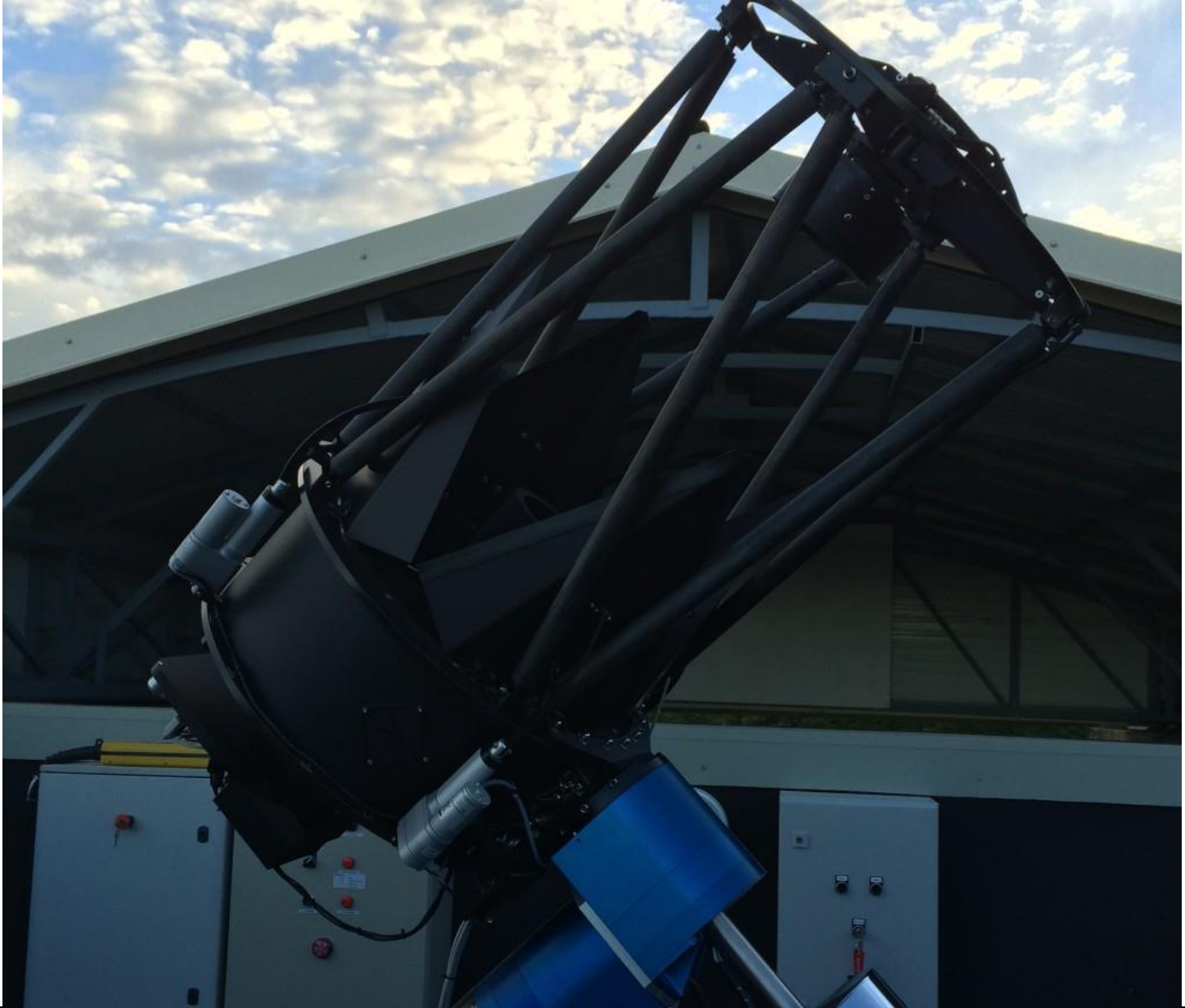
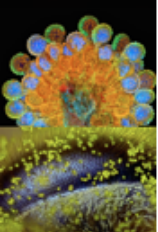


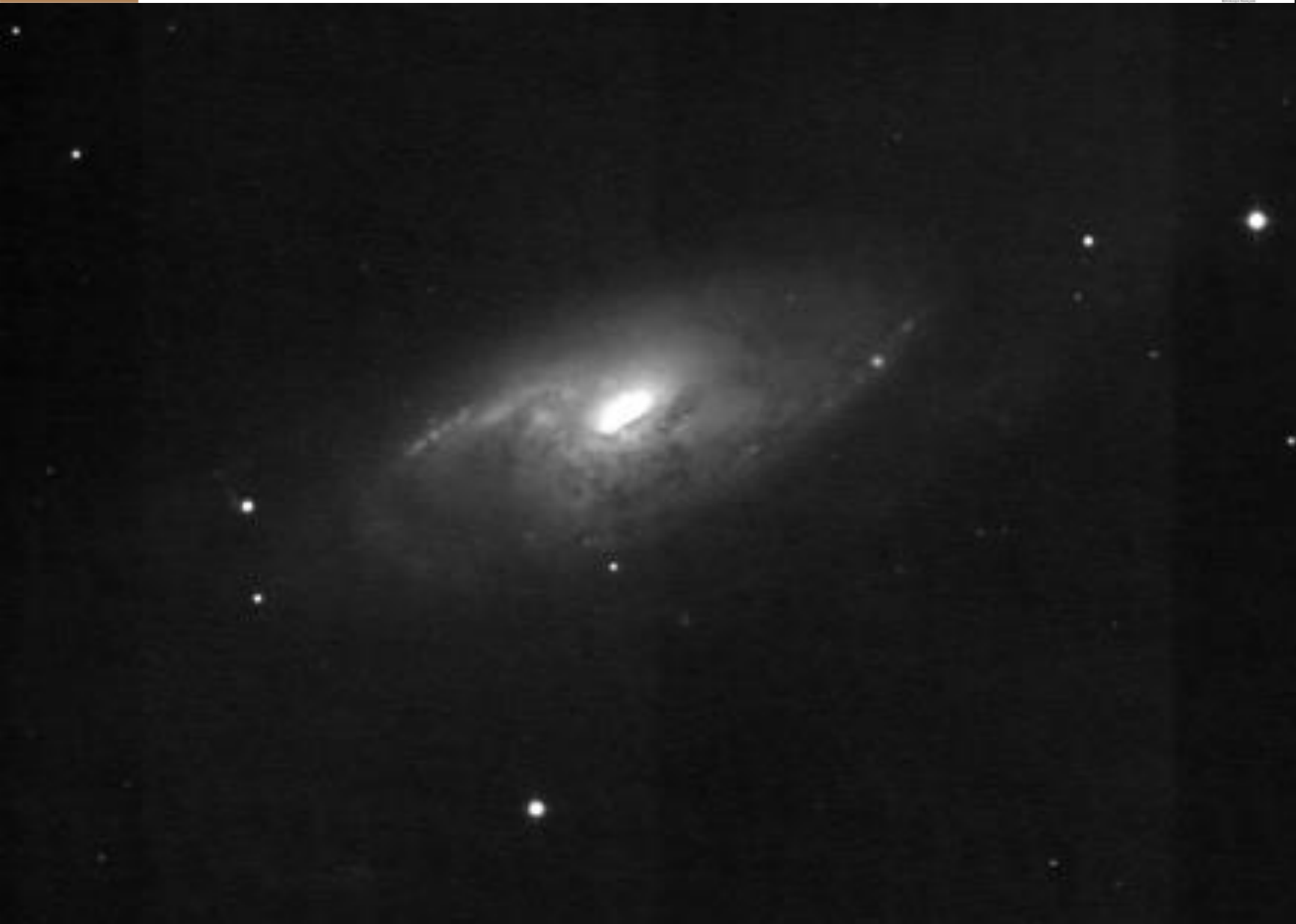
1915
Albert
Einstein

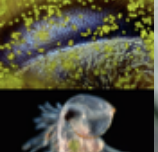
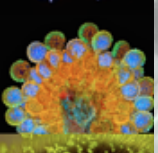
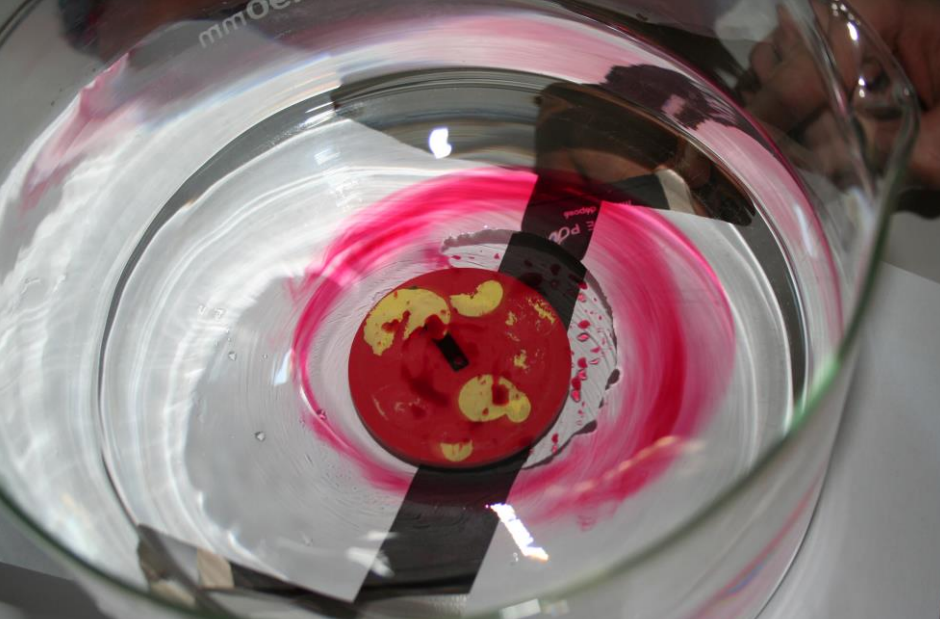
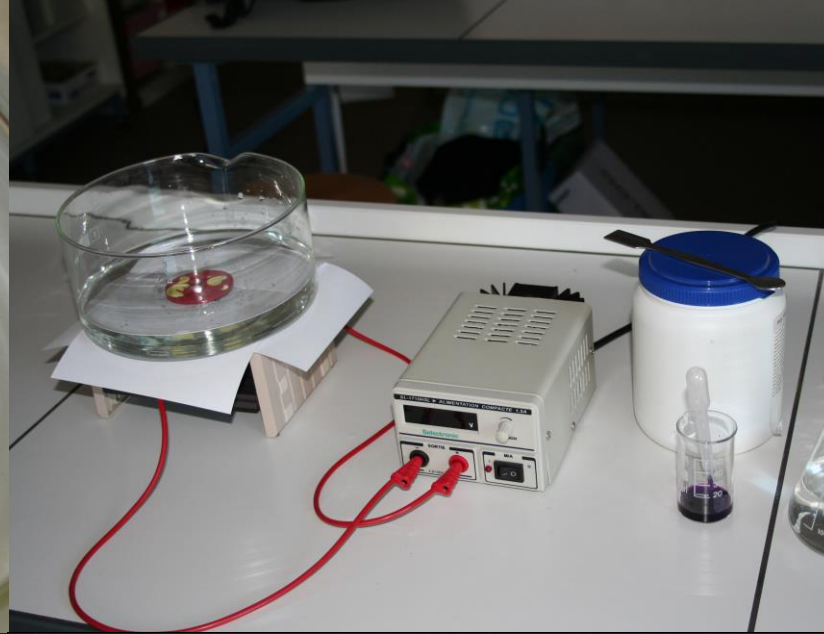
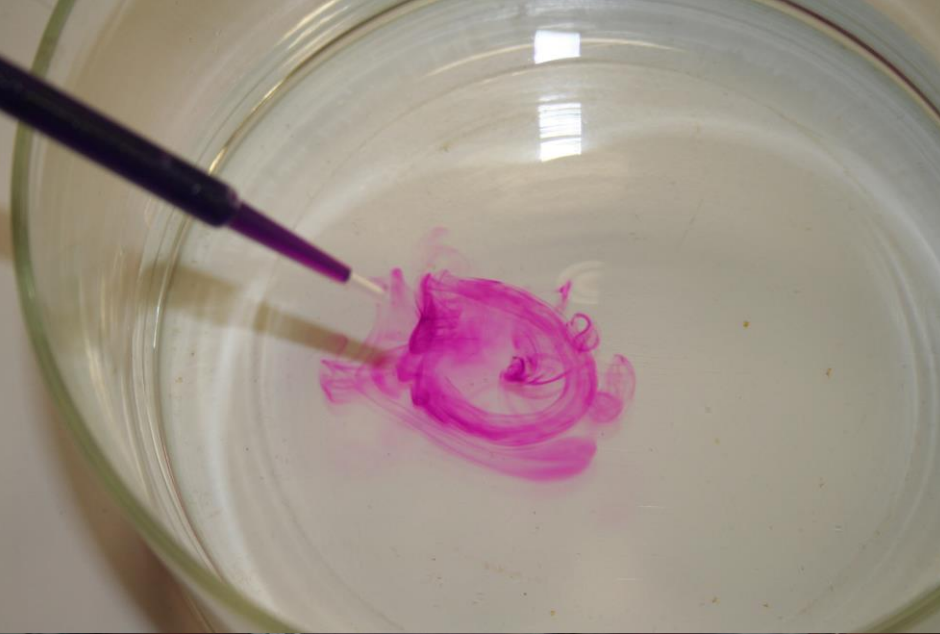
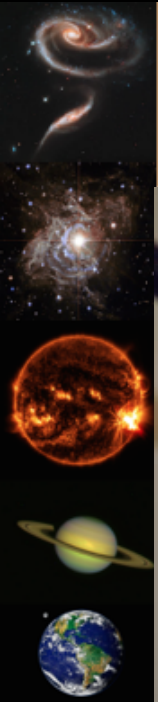


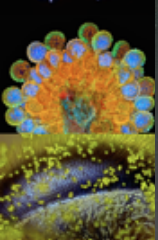
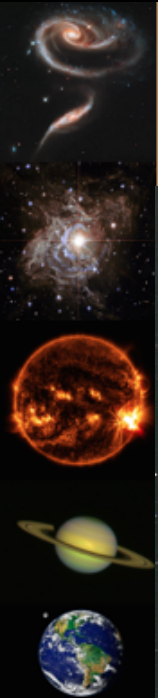


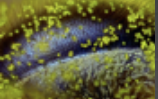
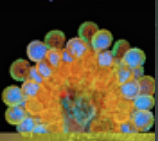
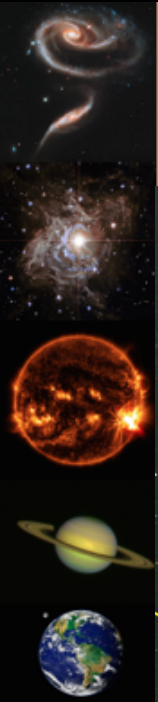


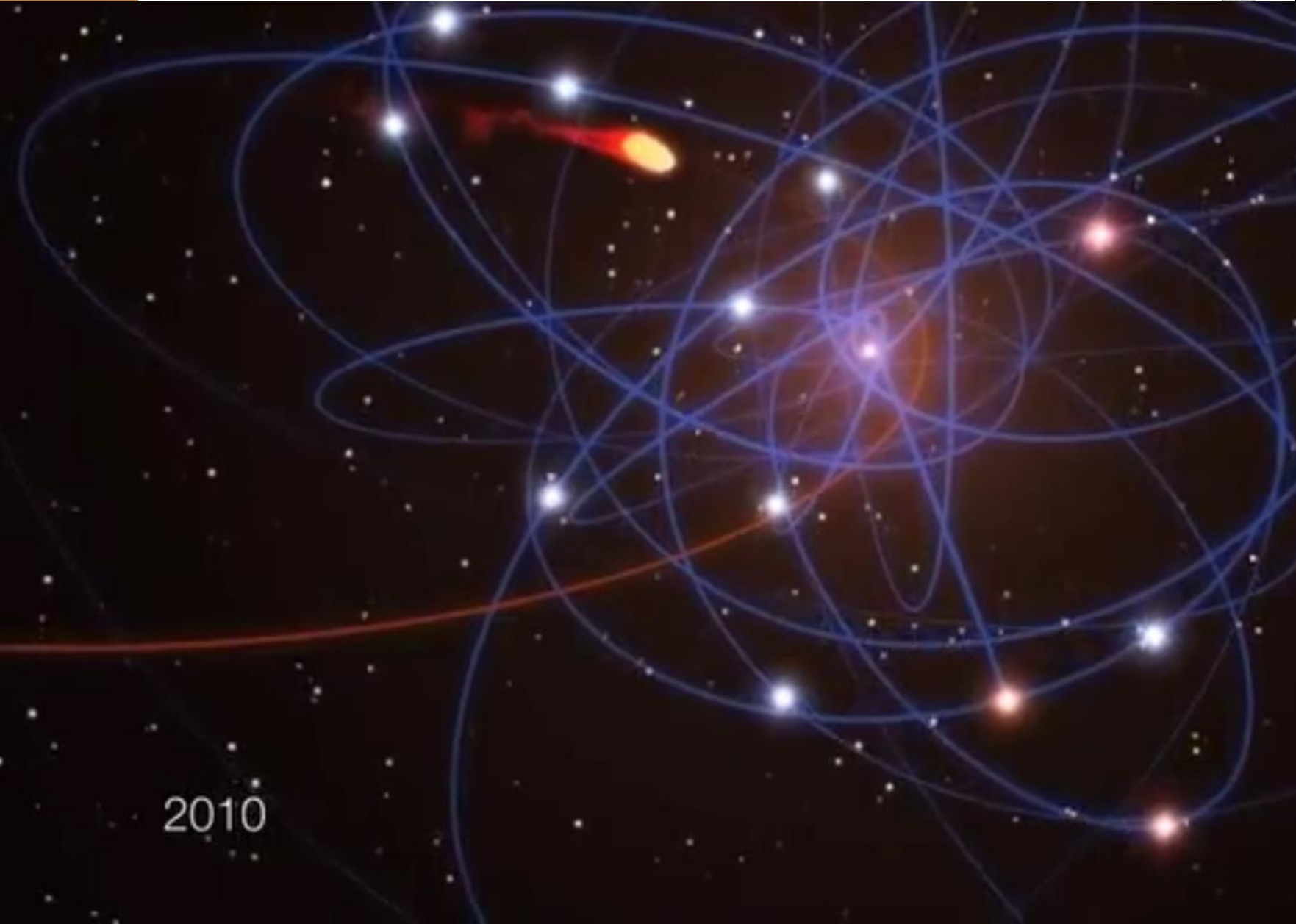
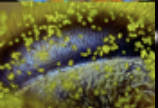
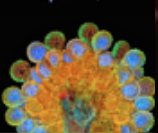




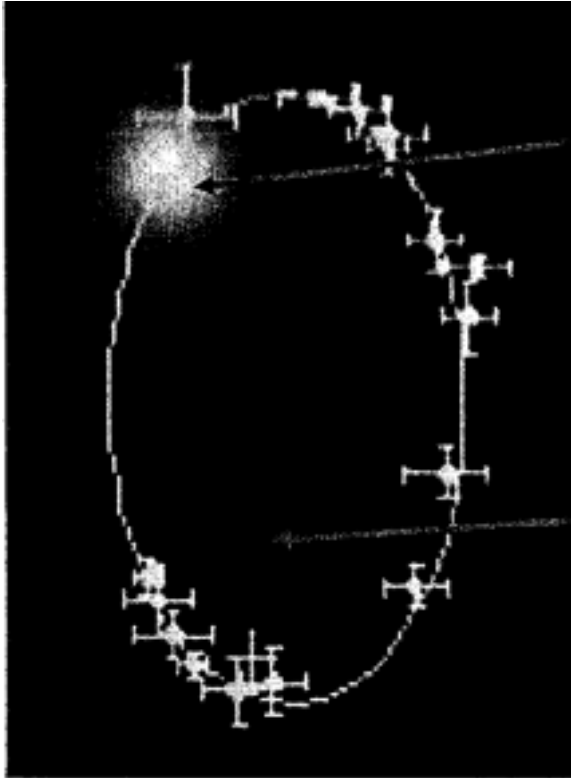








2010

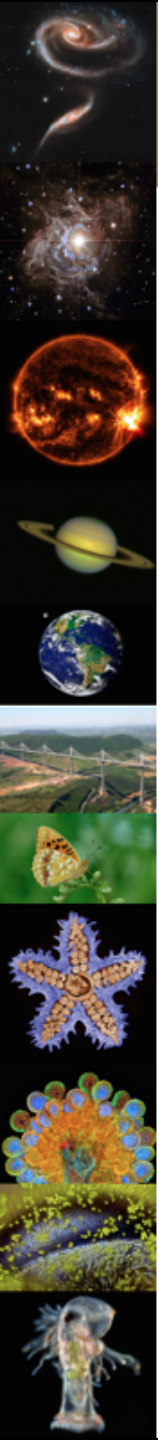


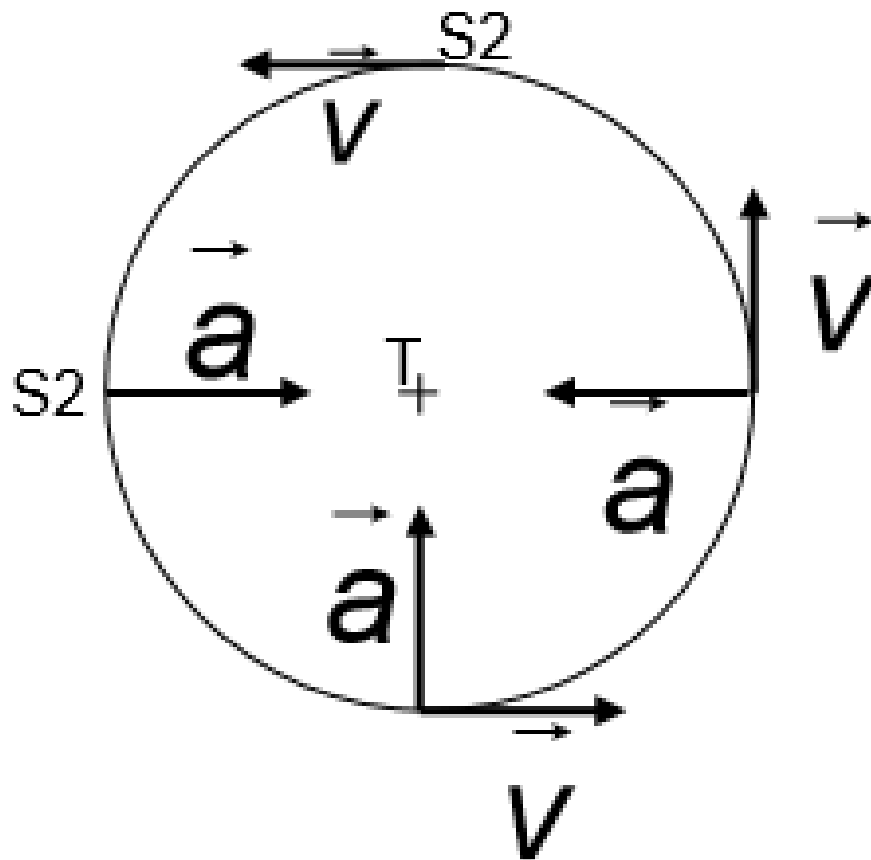
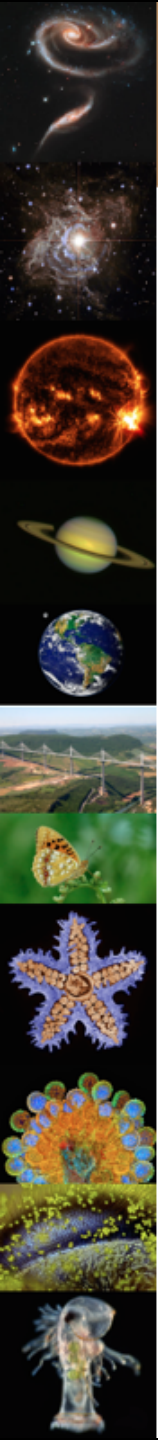
Étoile S2

Position du corps
sombre massif

Période de
révolution $t = 15,2$
années.

Rayon étoile S2
trou noir = 132
heures- lumière.





$$\vec{F} = m \cdot \vec{a}$$

$$G \cdot \frac{M \cdot m}{r^2} \cdot \vec{n} = m \cdot \frac{v^2}{r} \cdot \vec{n}$$

$$\text{Alors } G \cdot \frac{M \cdot m}{r^2} = m \cdot \frac{v^2}{r}$$

$$G \cdot \frac{M}{r} = v^2$$

On retrouve l'expression proposée : $v = \sqrt{G \cdot \frac{M}{r}}$.

L'étoile S2 parcourt son orbite de longueur $L = 2\pi.r$
 en une durée de révolution T .

$$v = \frac{2\pi.r}{T} \text{ donc } T = \frac{2\pi.r}{v}$$

$$T^2 = \frac{4\pi^2.r^2}{v^2} = \frac{4\pi^2.r^2}{\frac{G.M}{r}} = \frac{4\pi^2.r^3}{G.M}$$

$$T = 2\pi.\sqrt{\frac{r^3}{G.M}}$$

$$T^2 = \frac{4\pi^2 \cdot r^3}{G \cdot M} \text{ donc } M = \frac{4\pi^2 \cdot r^3}{G \cdot T^2}$$

Il faut convertir les heures-lumière en mètres et la période en secondes.

$$M = \frac{4\pi^2 \times (132 \times 3600 \times 3,00 \times 10^8)^3}{6,67 \times 10^{-11} \times (15,2 \times 365,25 \times 24 \times 3600)^2} = 7,45 \times 10^{36} \text{ kg}$$

Calculons le rapport $\frac{M}{M_S} = \frac{7,4530112555 \times 10^{36}}{2,0 \times 10^{30}} = 3,7 \times 10^6$

La valeur de la masse M du trou noir est cohérente puisqu'elle vaut 3,7 millions de fois la masse solaire.



