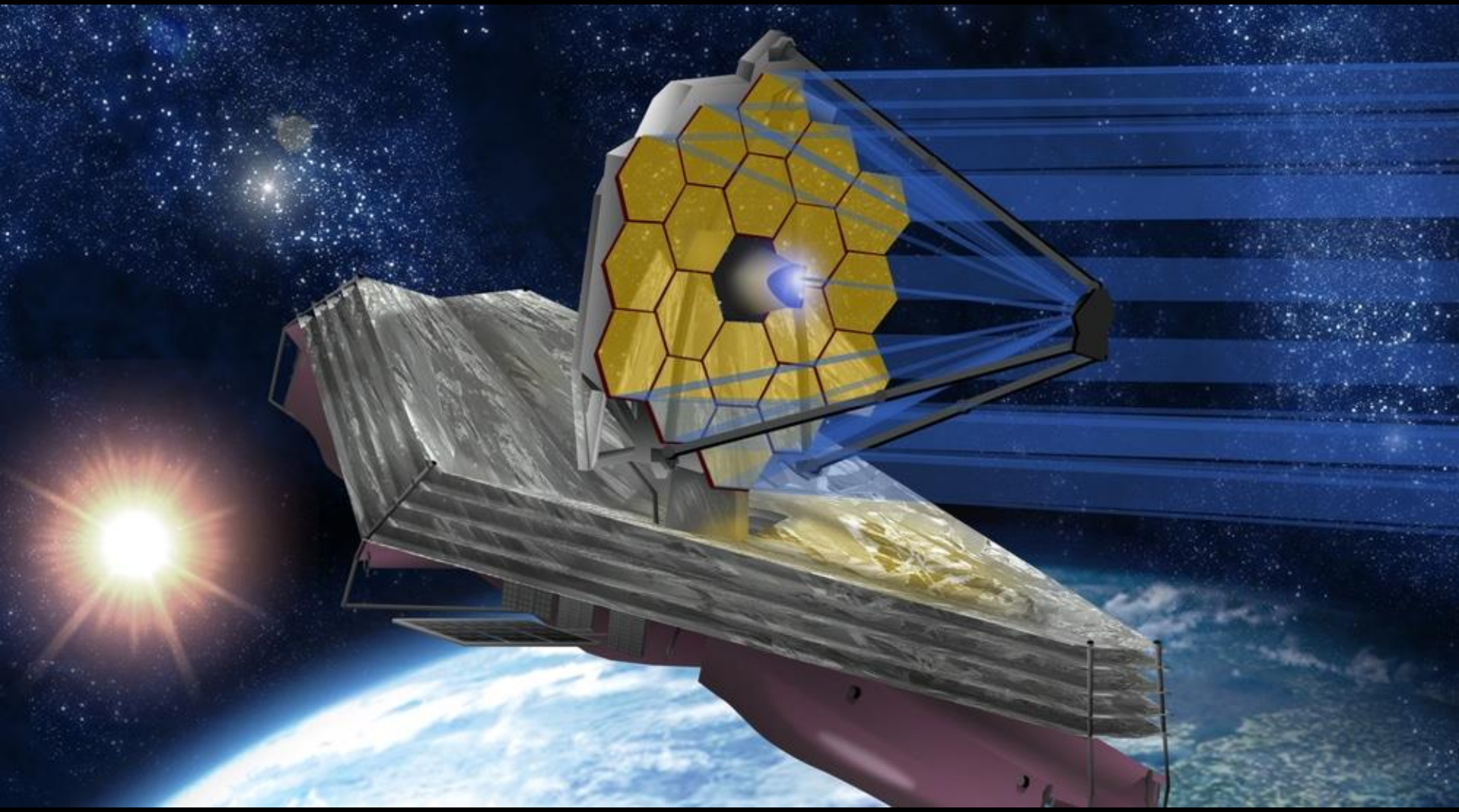
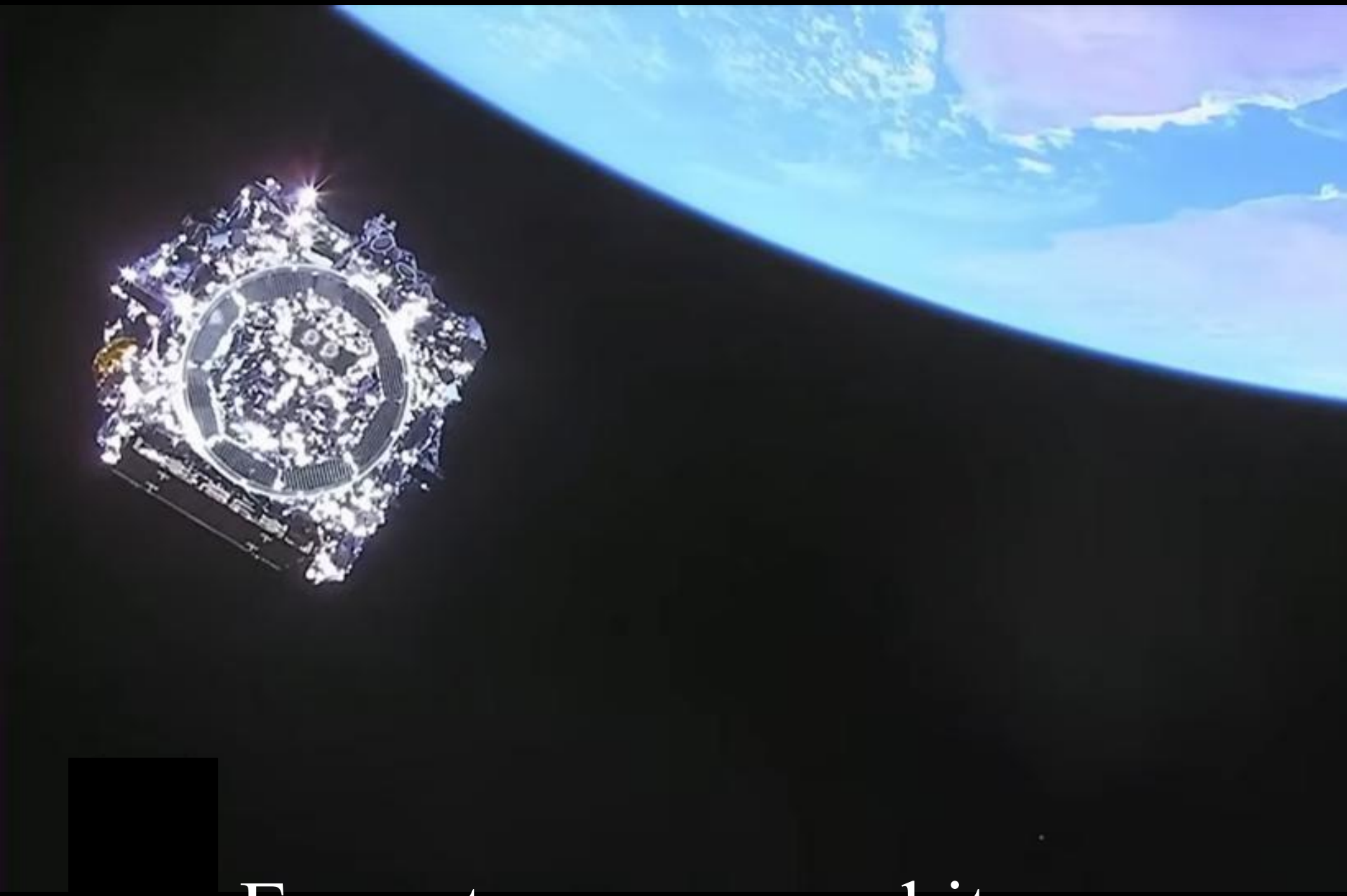
Le télescope spatial James Webb



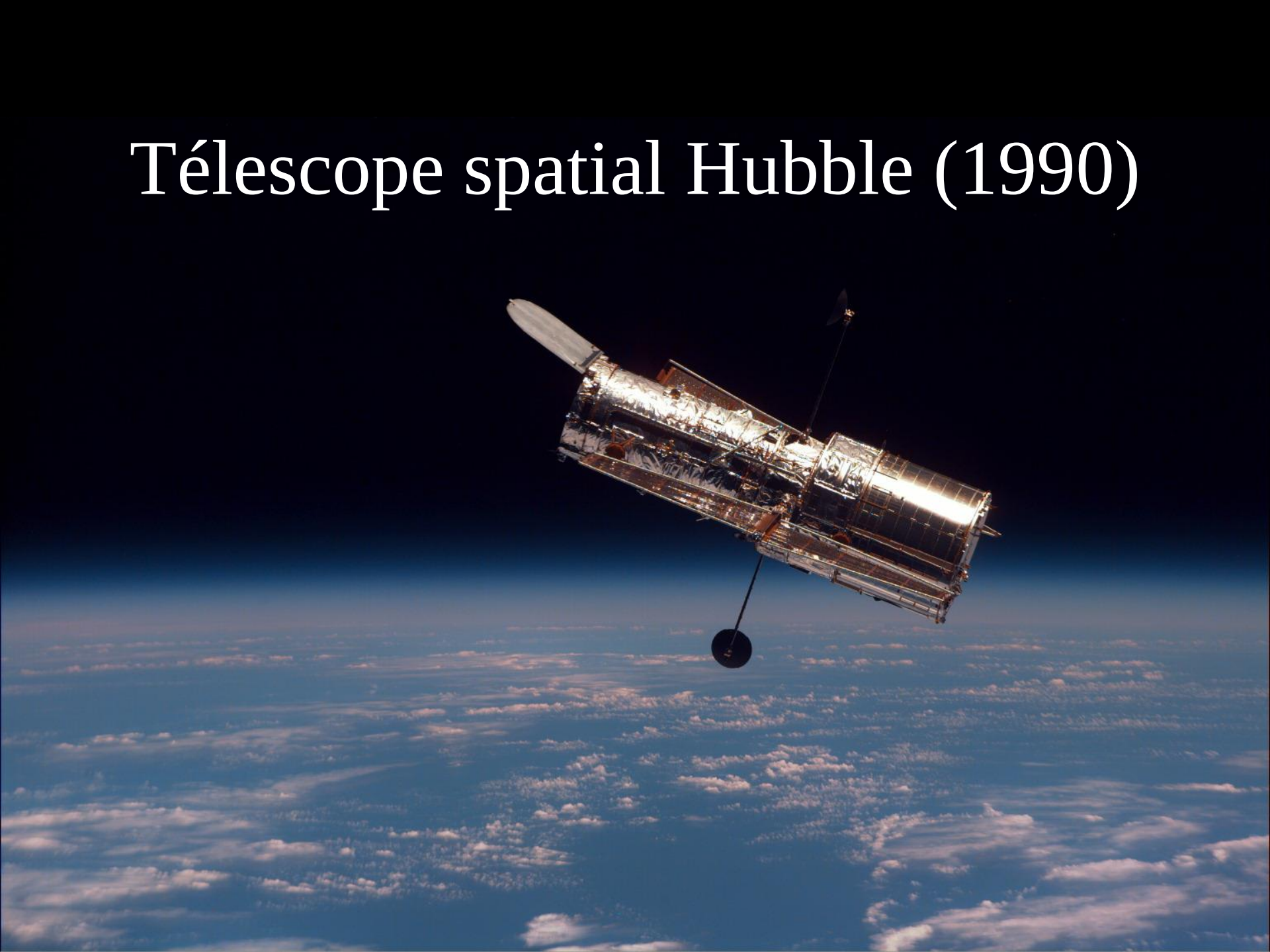
Jean-Noël Sarrail – Pupenvol – 18 janvier 2023

James Webb lancé le 25 décembre 2021 par Ariane 5

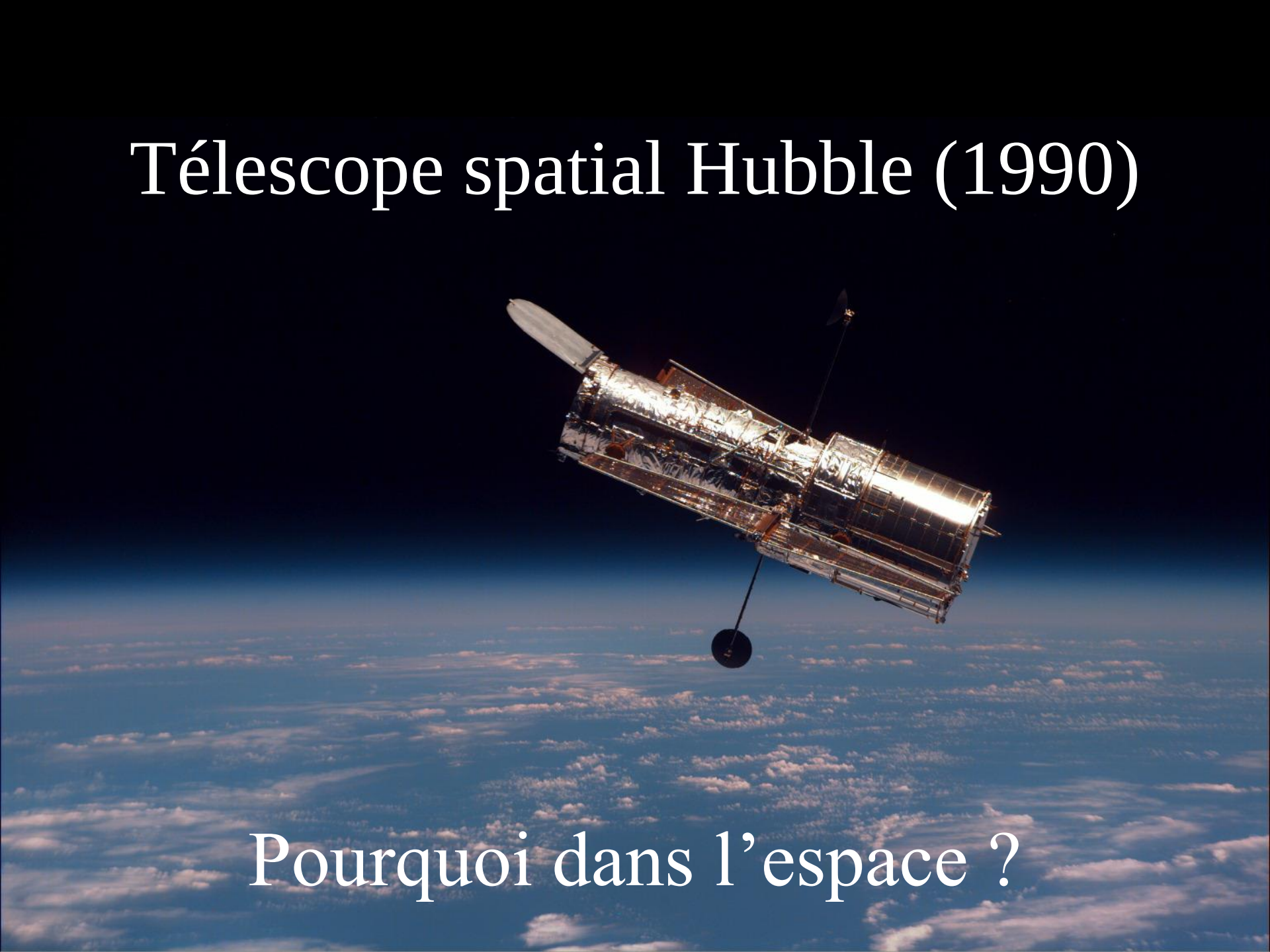


En route vers son orbite…

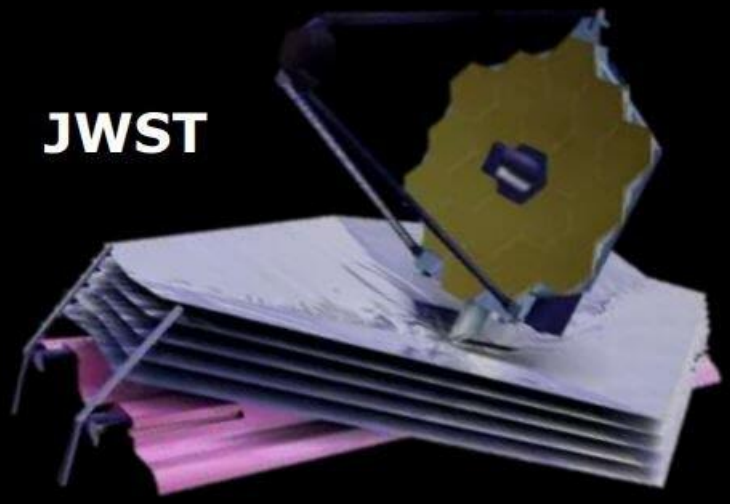
Télescope spatial Hubble (1990)

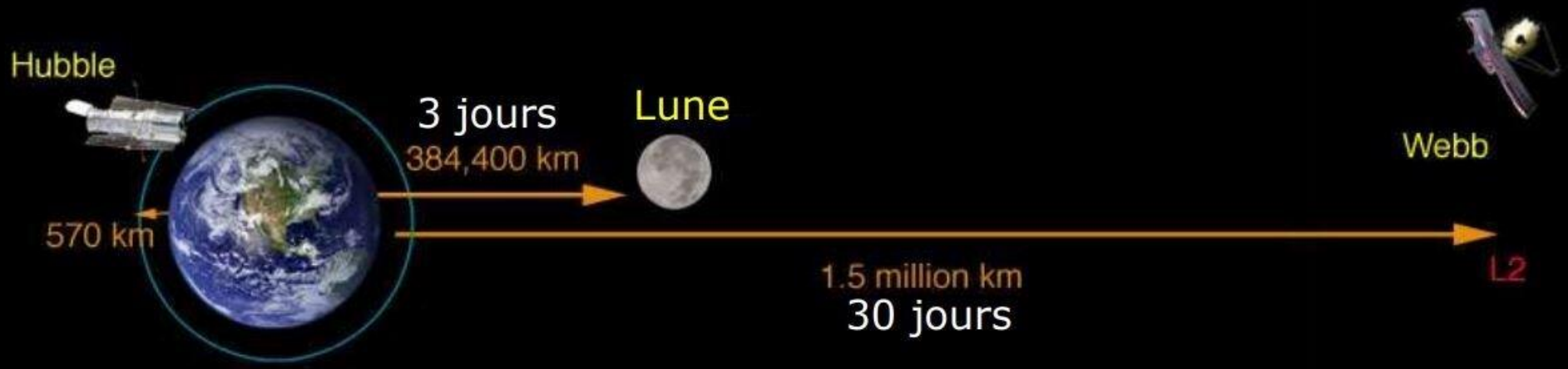


Télescope spatial Hubble (1990)

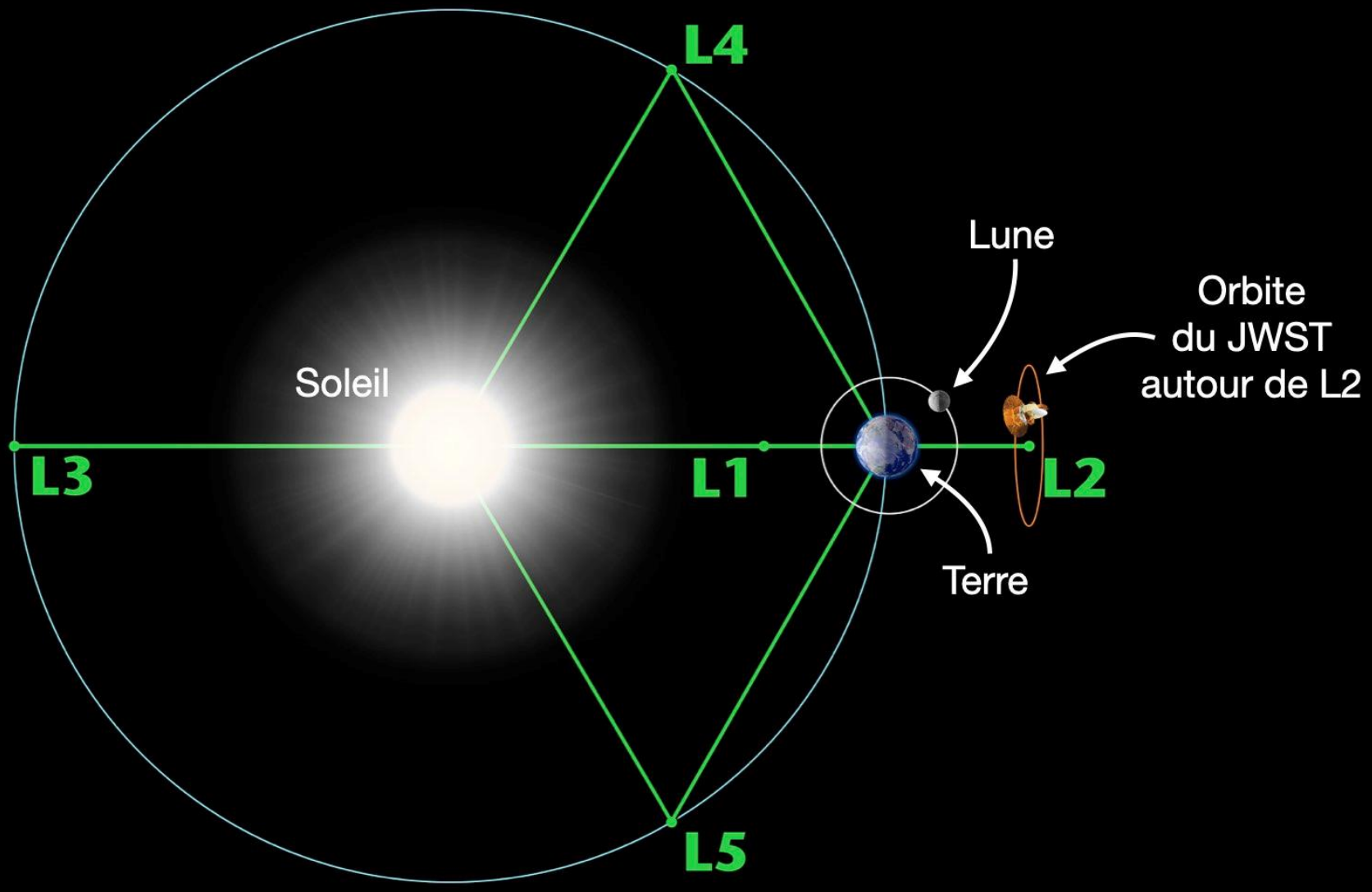


Pourquoi dans l’espace ?



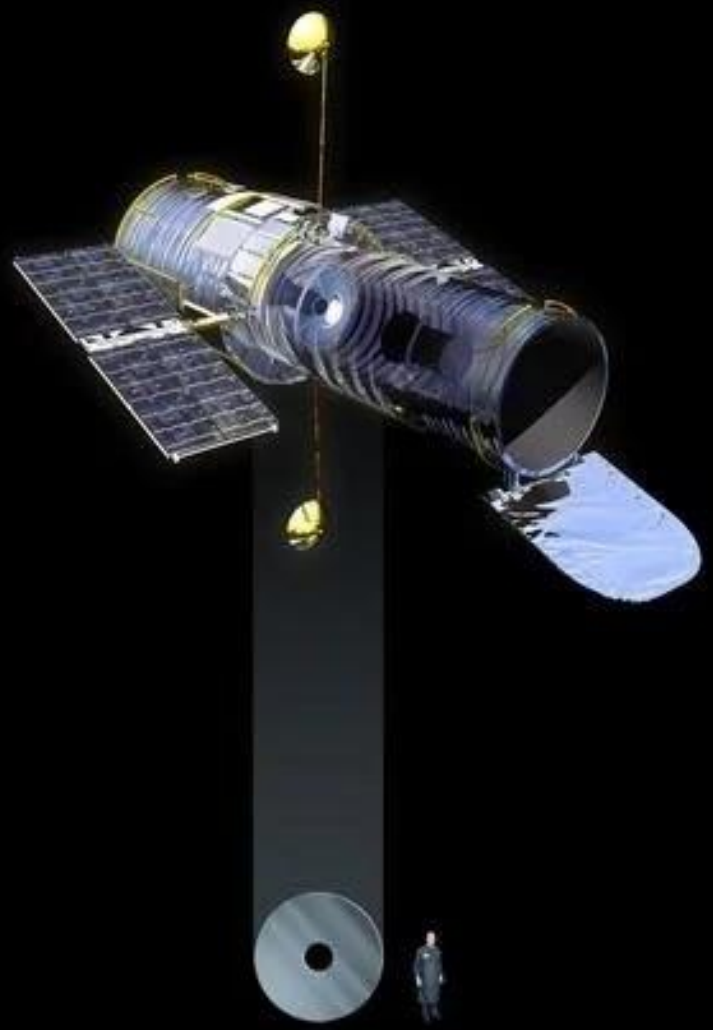


Pourquoi si loin ?



Point de Lagrange L2 - 1,5 million km

Hubble 2,4m / James Webb 6,5m

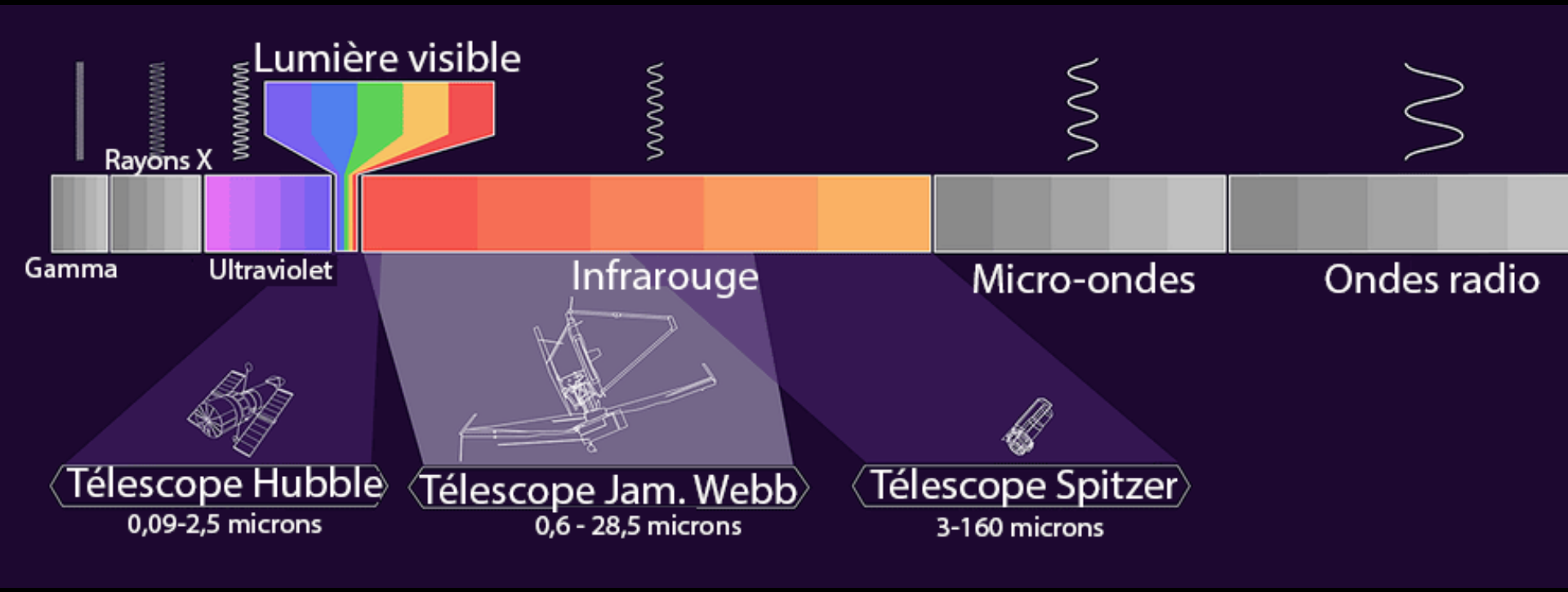


18 miroirs hexagonaux de 1,3m

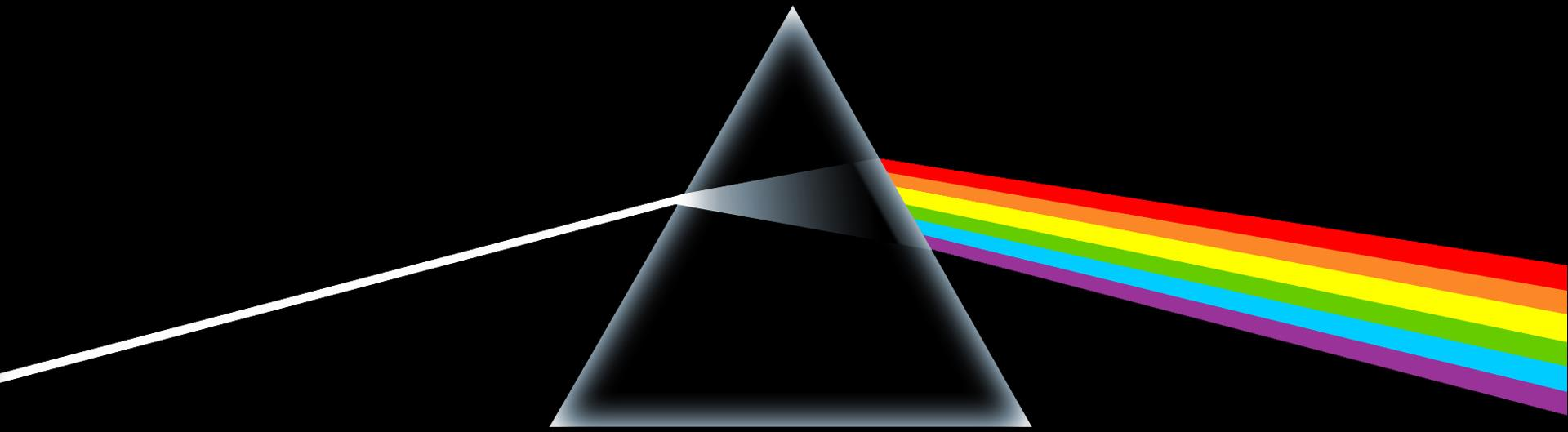
18 miroirs hexagonaux de 1,3m

James Webb replié

Bouclier thermique : 400 poulies !

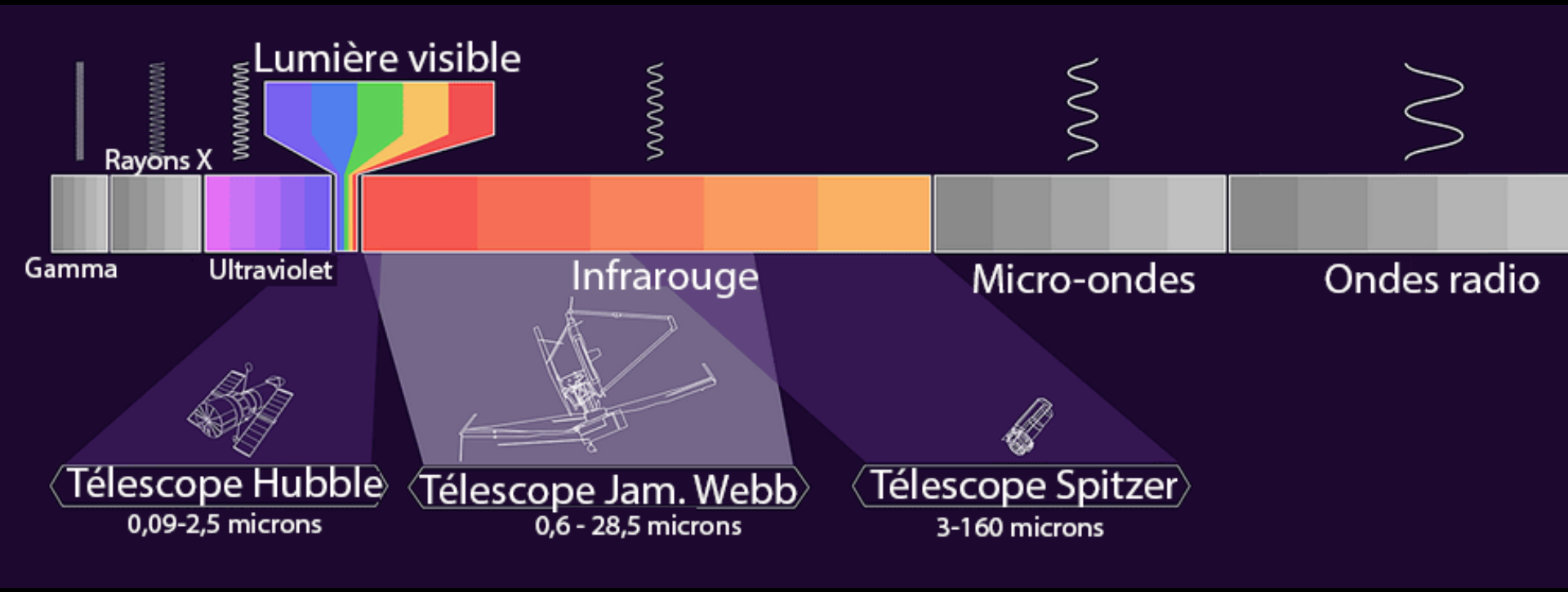


Les différentes « lumières »

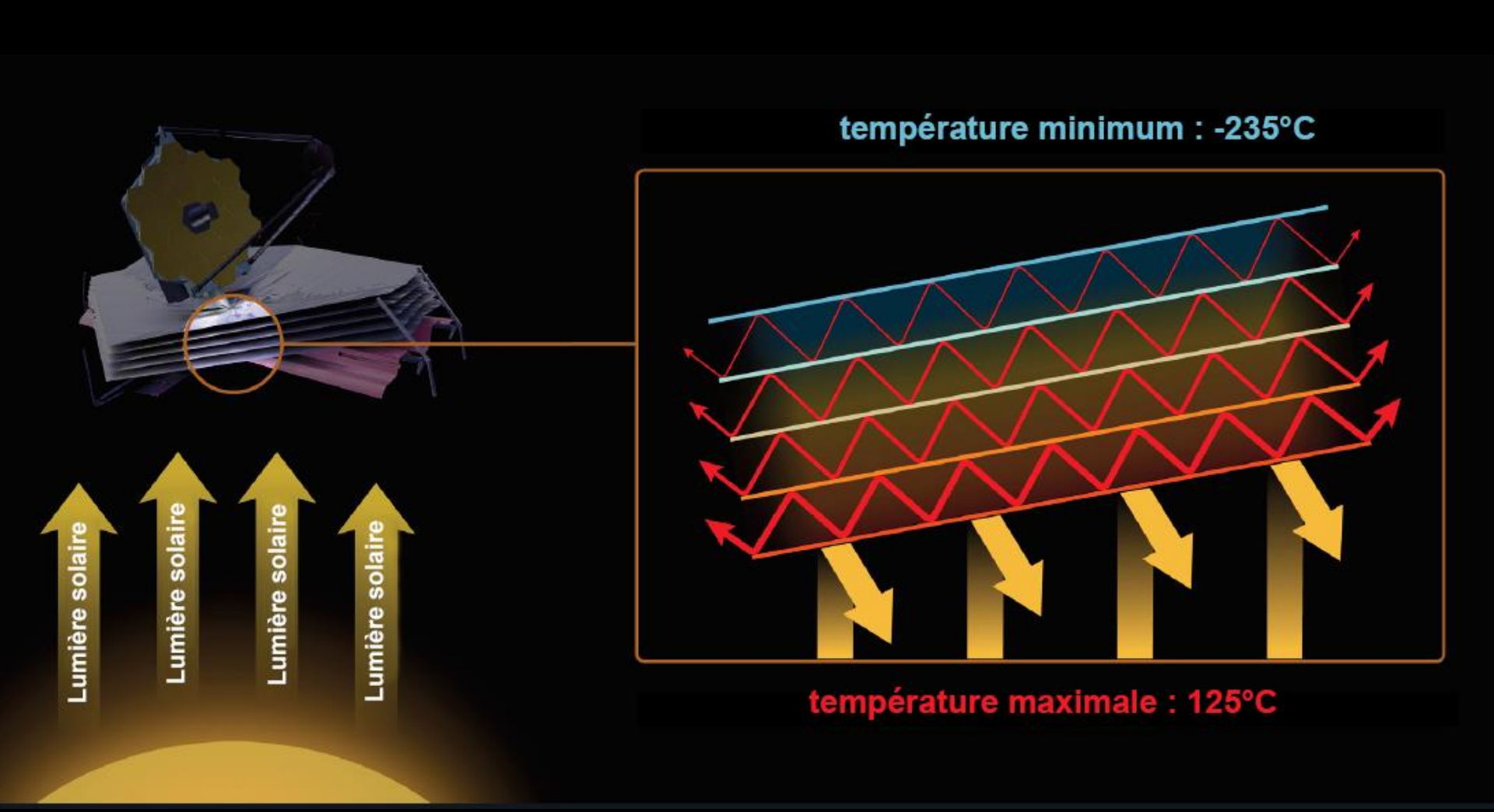


The dark side of the moon

PINK FLOYD



Les différentes « lumières »



Refroidir James Webb !

10 000 personnes l’ont conçu sur 30 ans !

Coût : 10 milliards €

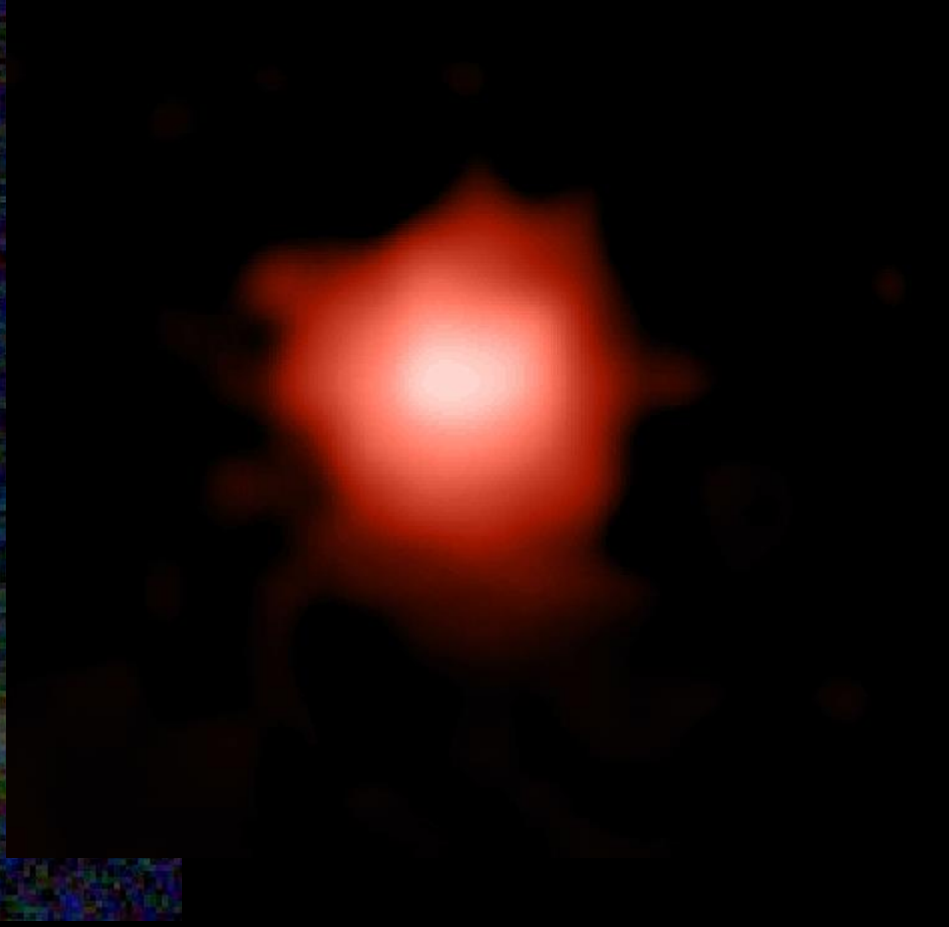
Coût du projet Dassault-Airbus ?

Coût : 100 milliards € minimum…

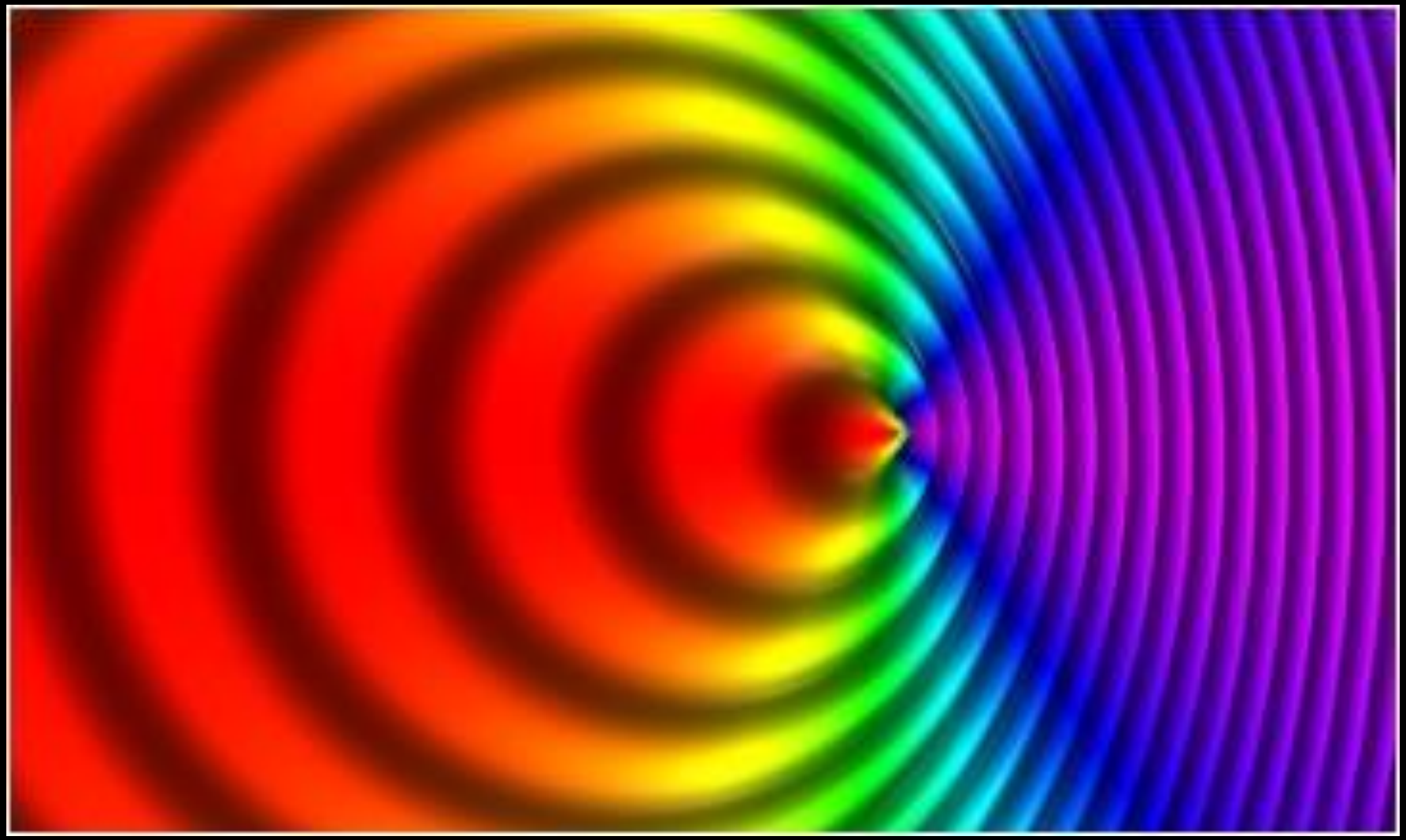
Première photo du 11 juillet 2022
Amas de galaxies à 4,6 milliards a.l.

Vu par Hubble

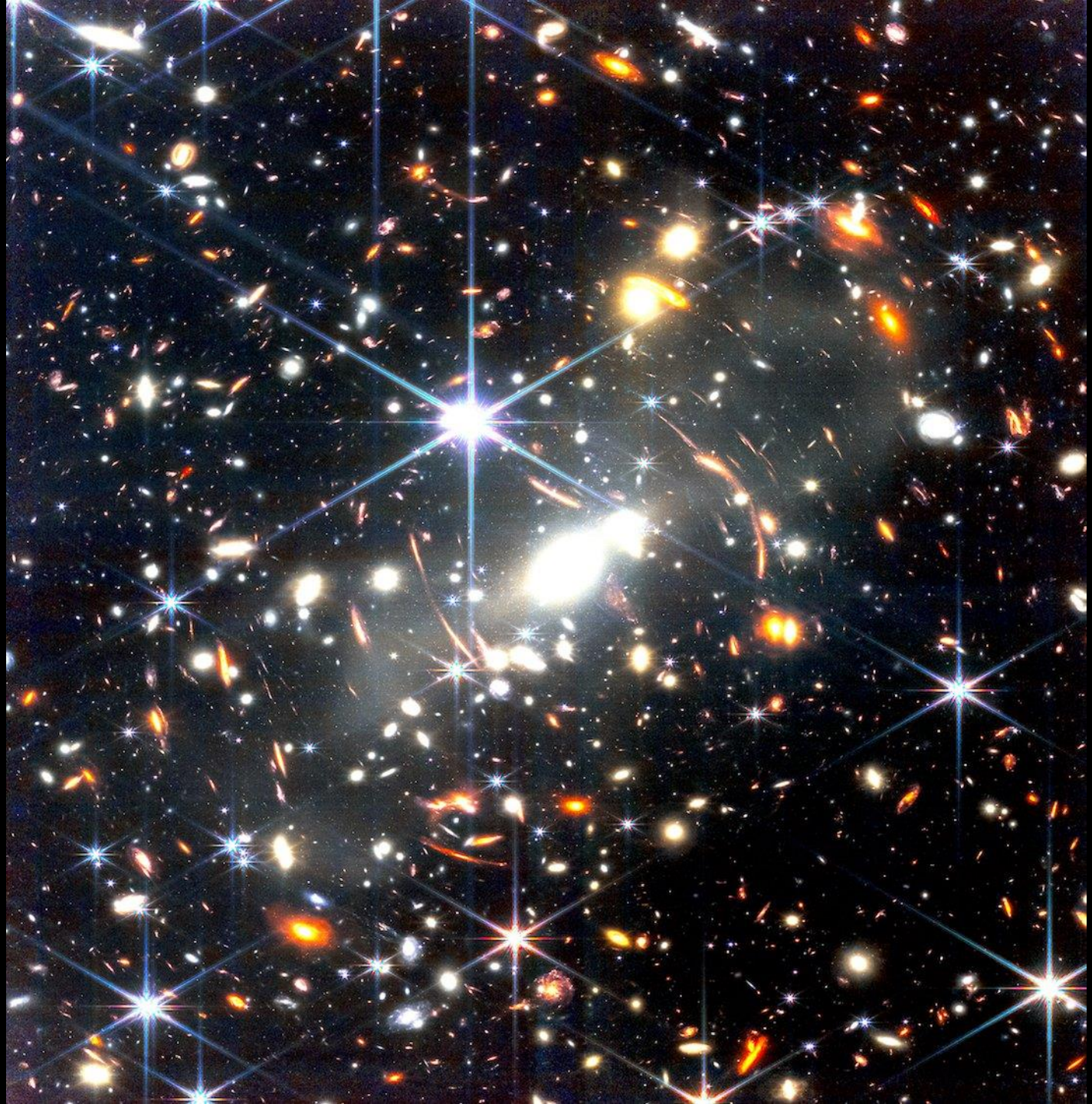
Voir loin, c’est voir tôt !



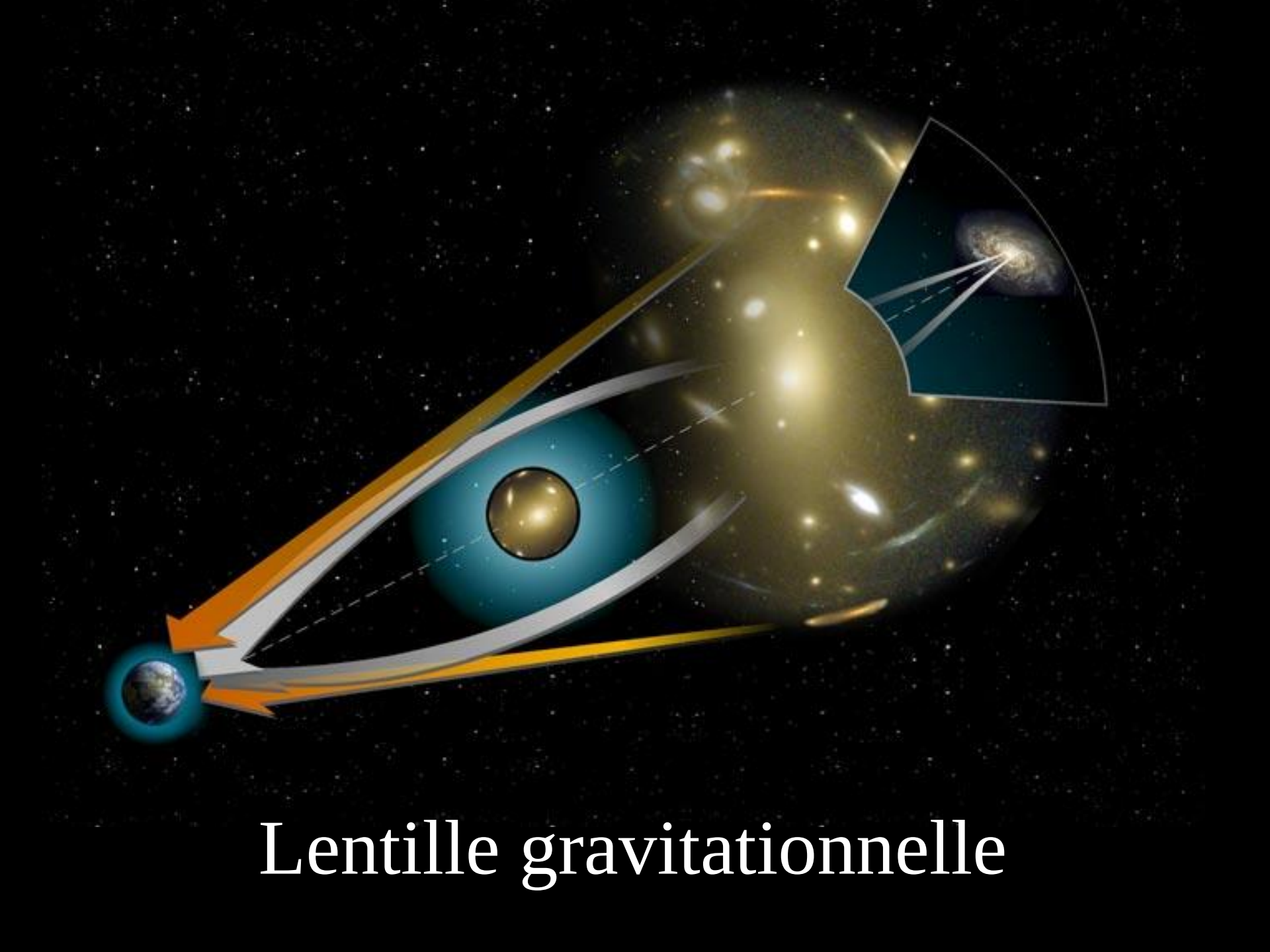
La galaxie la plus lointaine jamais observée à 13,5 milliards a.l. !



Expansion de l’univers et effet Doppler



Mirages gravitationnels !

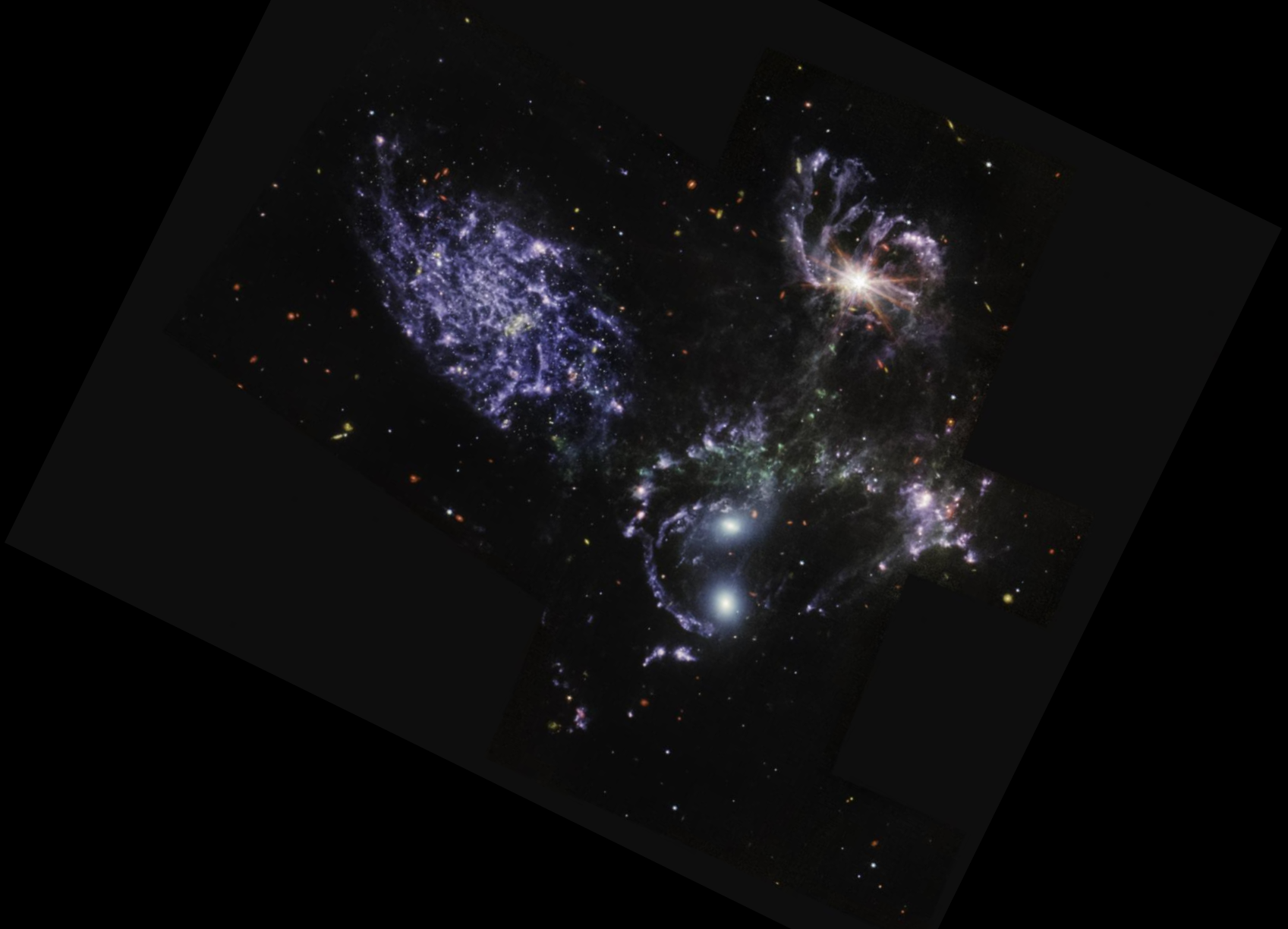


Lentille gravitationnelle

La galaxie du béret ou de la crêpe ?

La nuit étoilée – Van Gogh (1889)

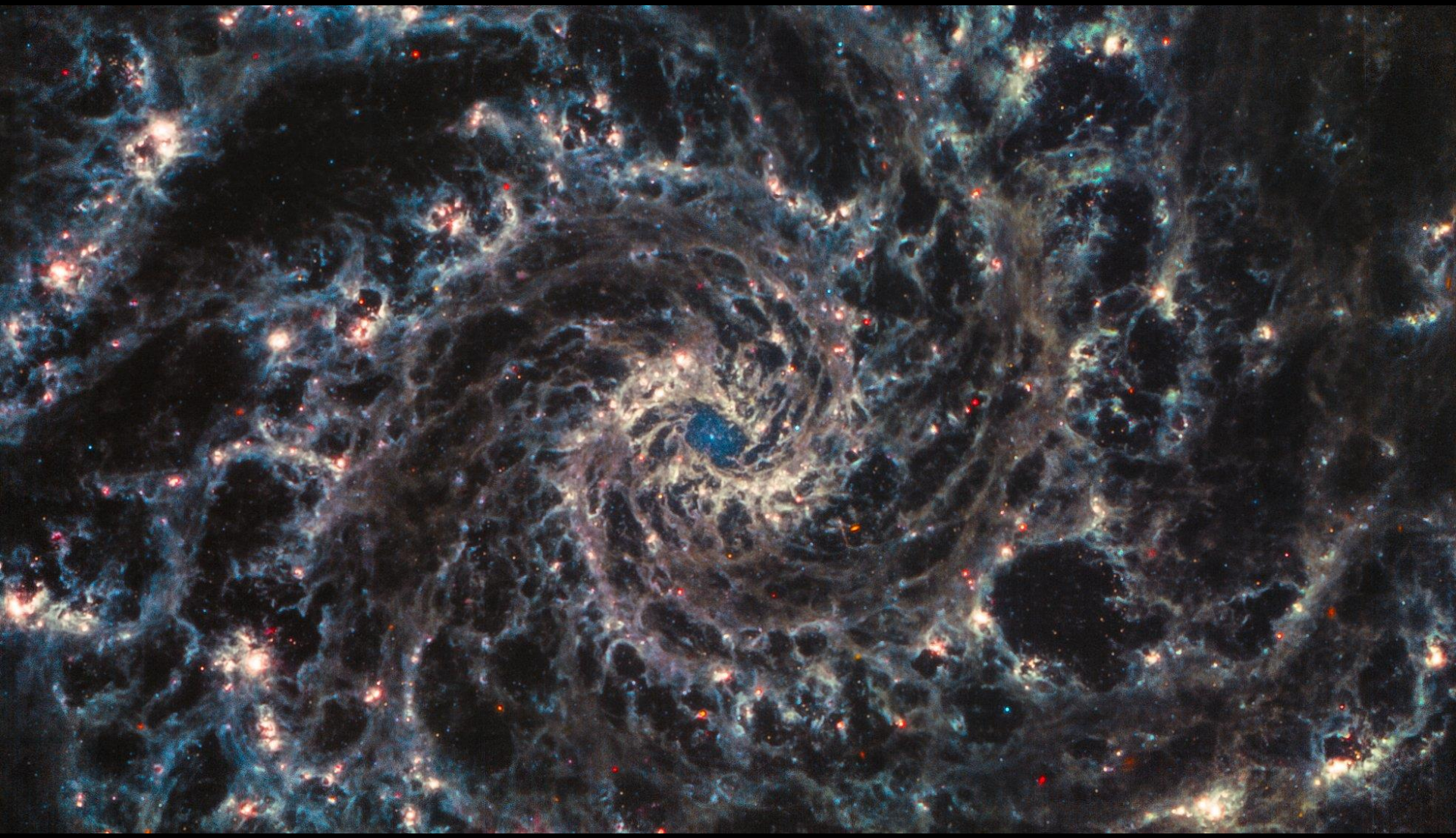
Le quintet de Stephan (Hubble)



Le quintet de Stephan 340 millions a.l.

Fusion de 2 galaxies 500 millions a.l.

Galaxie M 74 (Hubble)
32 millions a.l.



Galaxie M 74 dans les Poissons
32 millions a.l.

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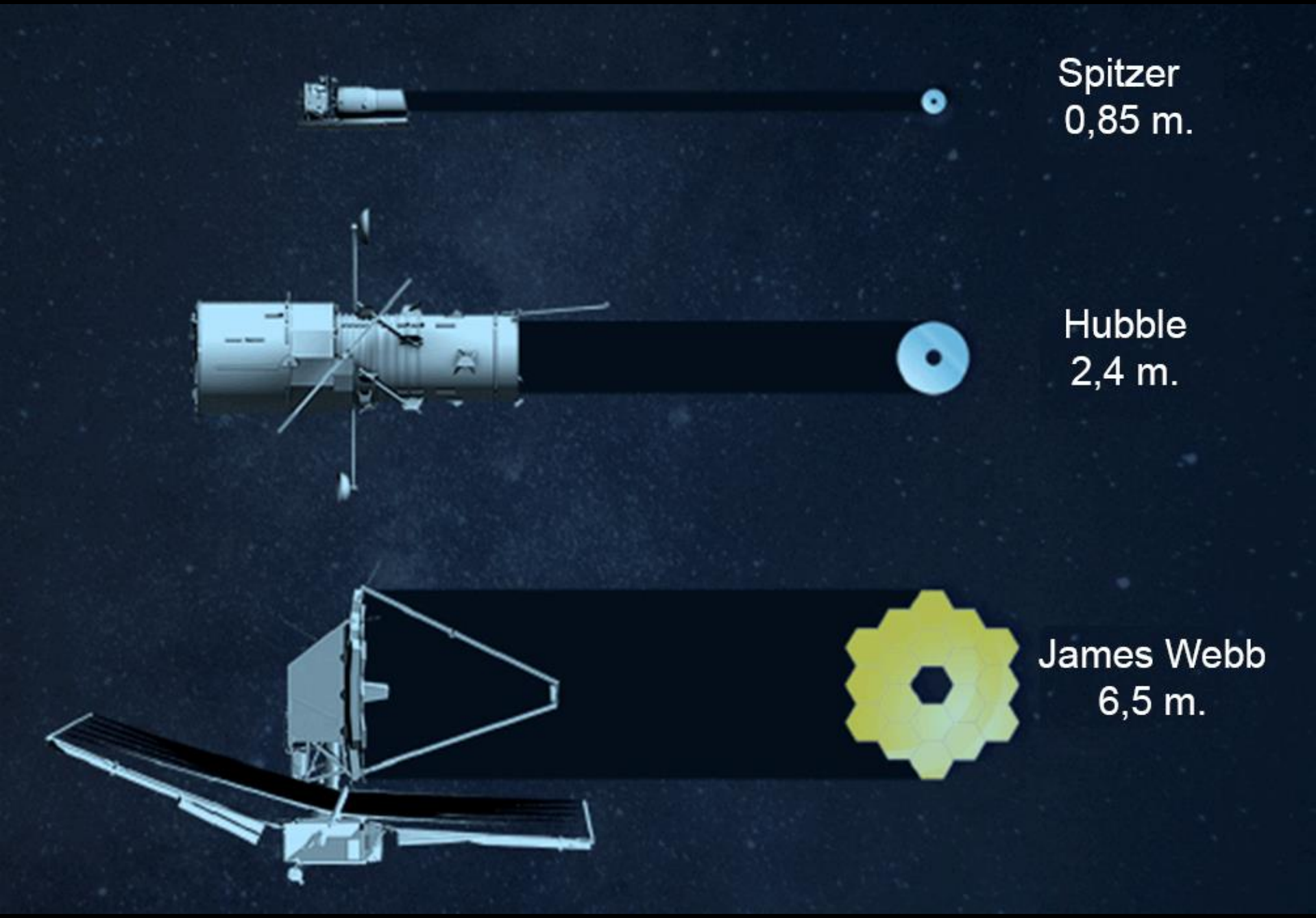
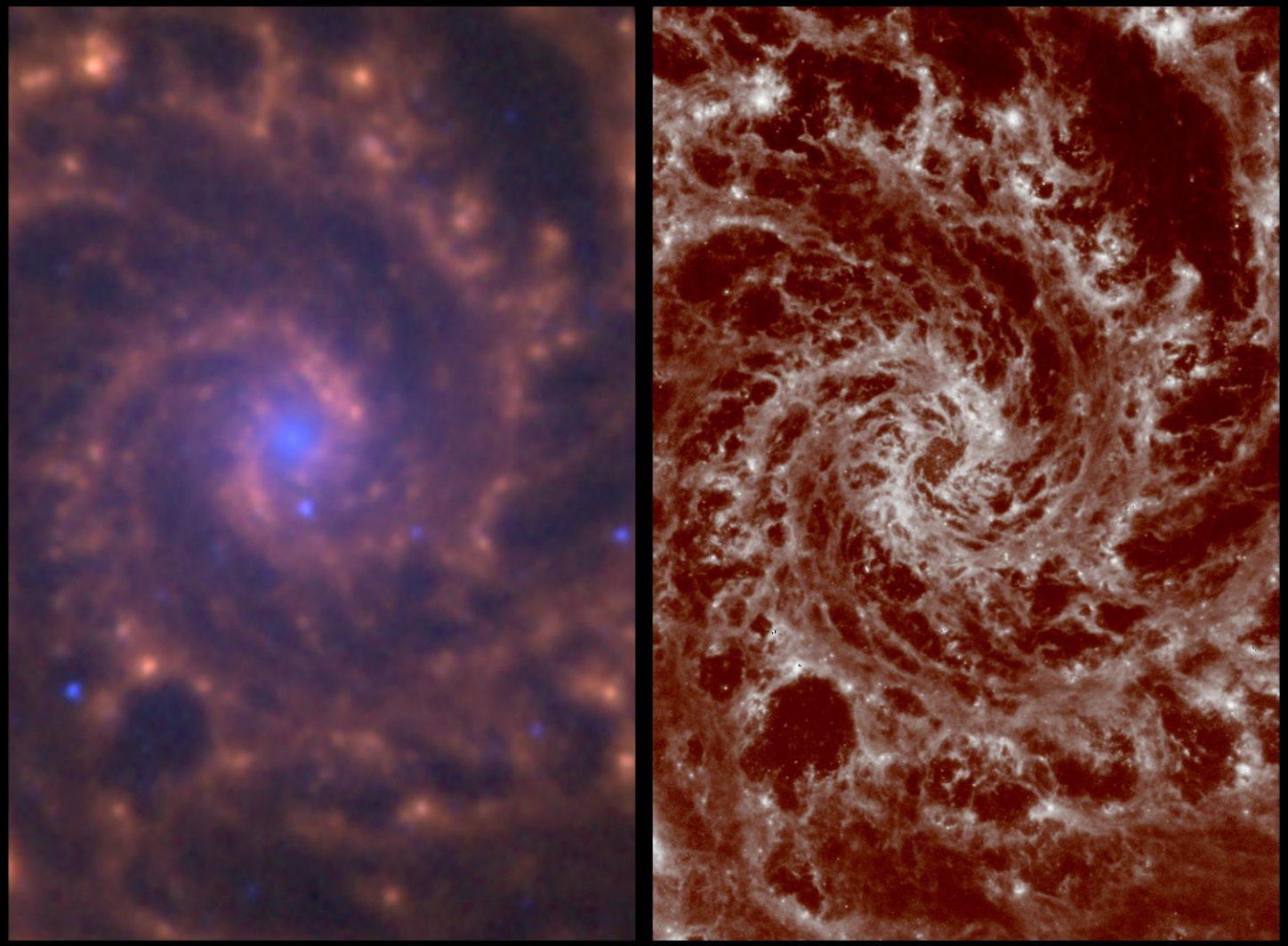

Spitzer
0,85 m.
Hubble
2,4 m.
James Webb
6,5 m.



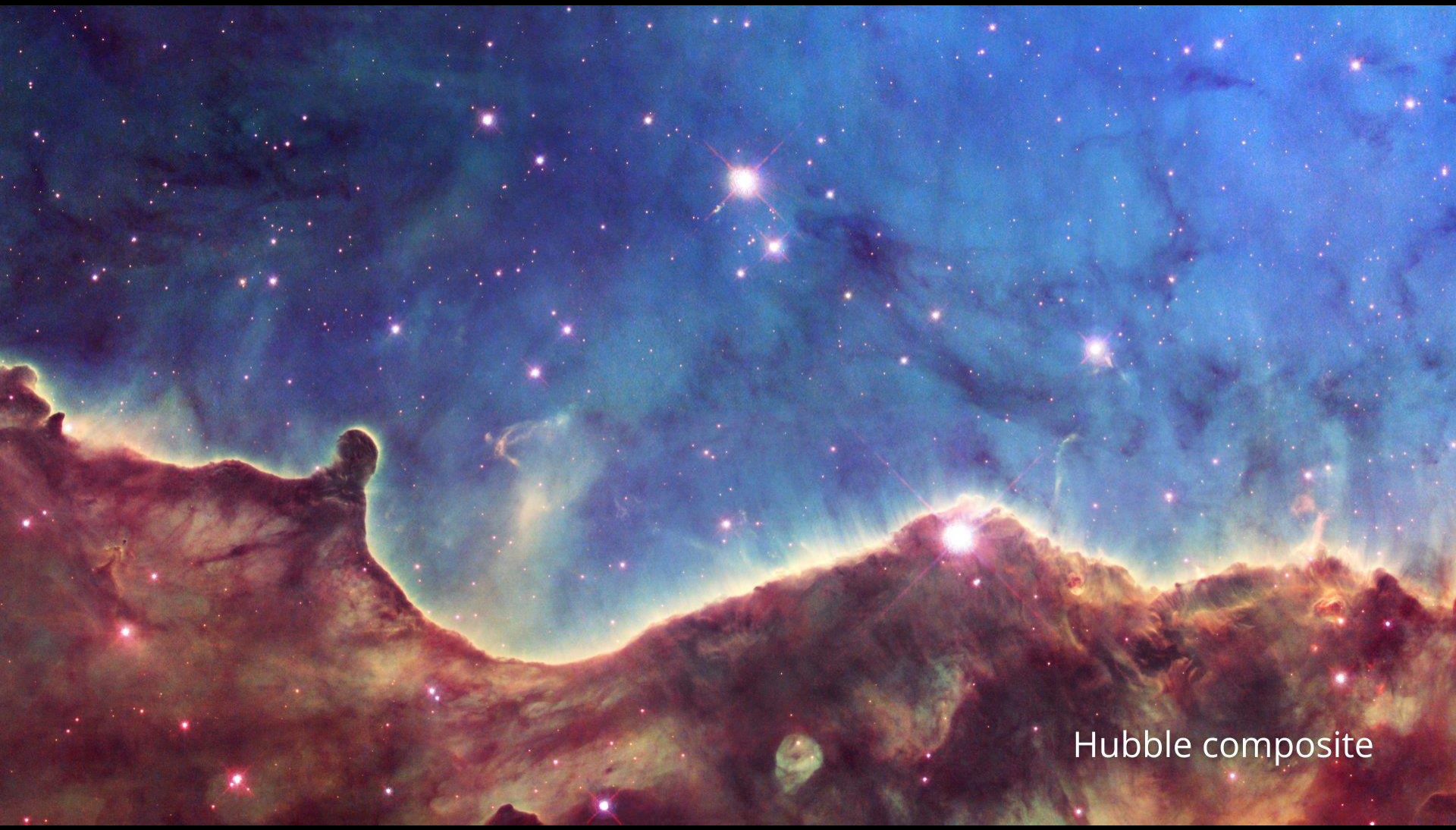
Galaxie M 74 dans les Poissons
32 millions a.l.

Petit et Grand Nuages de Magellan
200 000 et 160 000 a.l.

NGC 346 – 200 000 a.l. (Hubble)

NGC 346 – 200 000 a.l.

Nébuleuse de la Tarentule 160 000 a.l.
James Webb (IR) + Chandra (X)



Nébuleuse de la Carène 8500 a.l. (Hubble)

Nébuleuse de la Carène
8500 a.l.

Nébuleuse de la Carène
8500 a.l.

JAMES WEBB SPACE TELESCOPE

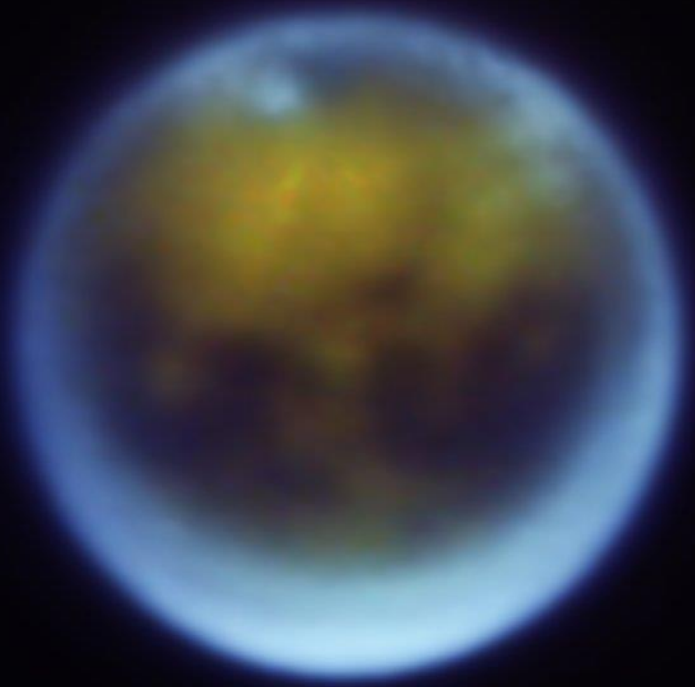
CARINA NEBULA | NGC 3324

Nébuleuse de l’anneau austral
dans les Voiles à 2000 a.l. (Hubble)

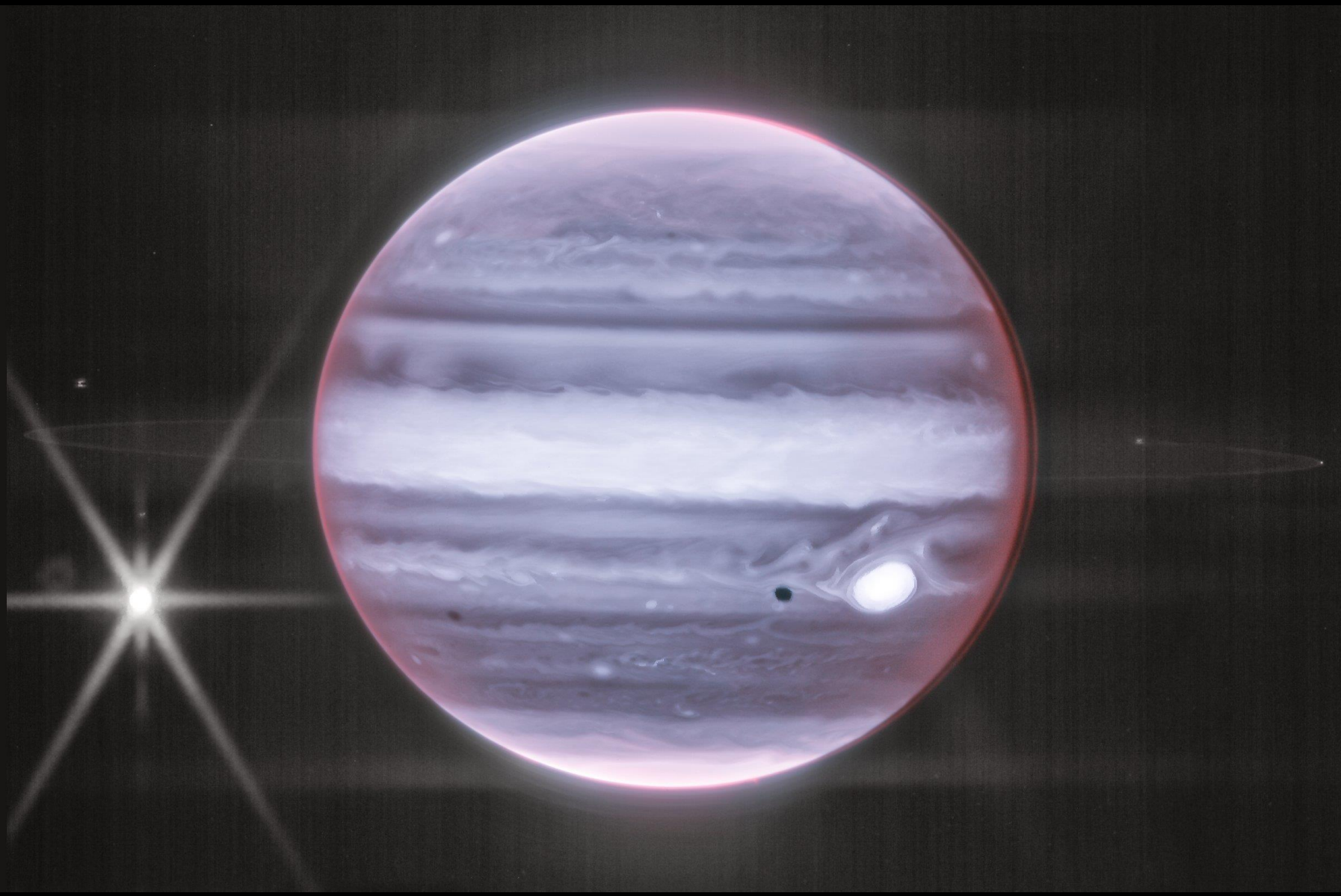
Nébuleuse de l’anneau austral dans les Voiles à 2000 a.l.

Neptune et ses anneaux

Titan… et Saturne
vus par un télescope terrestre

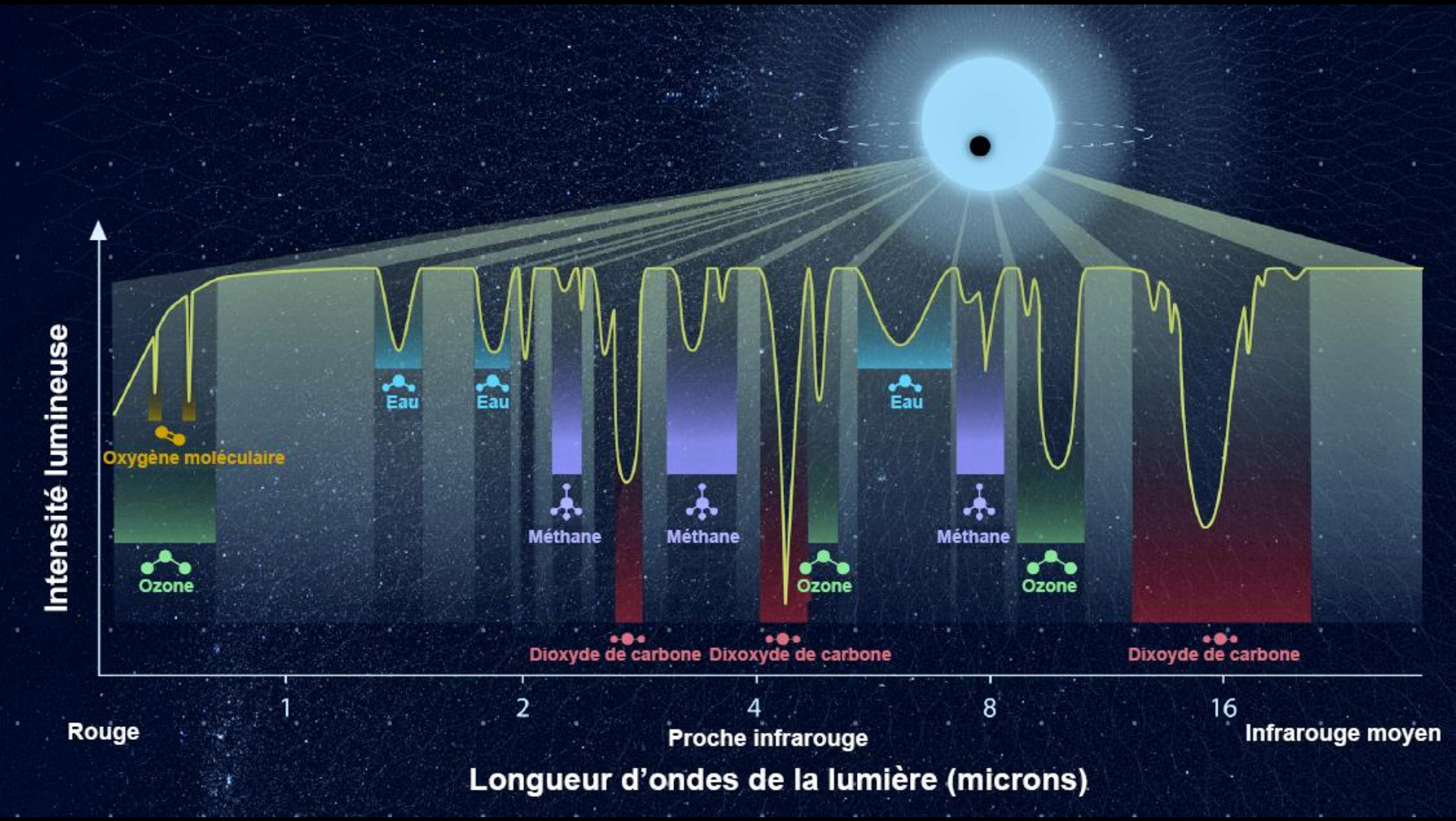


Titan, son atmosphère d’azote
et ses océans de méthane !

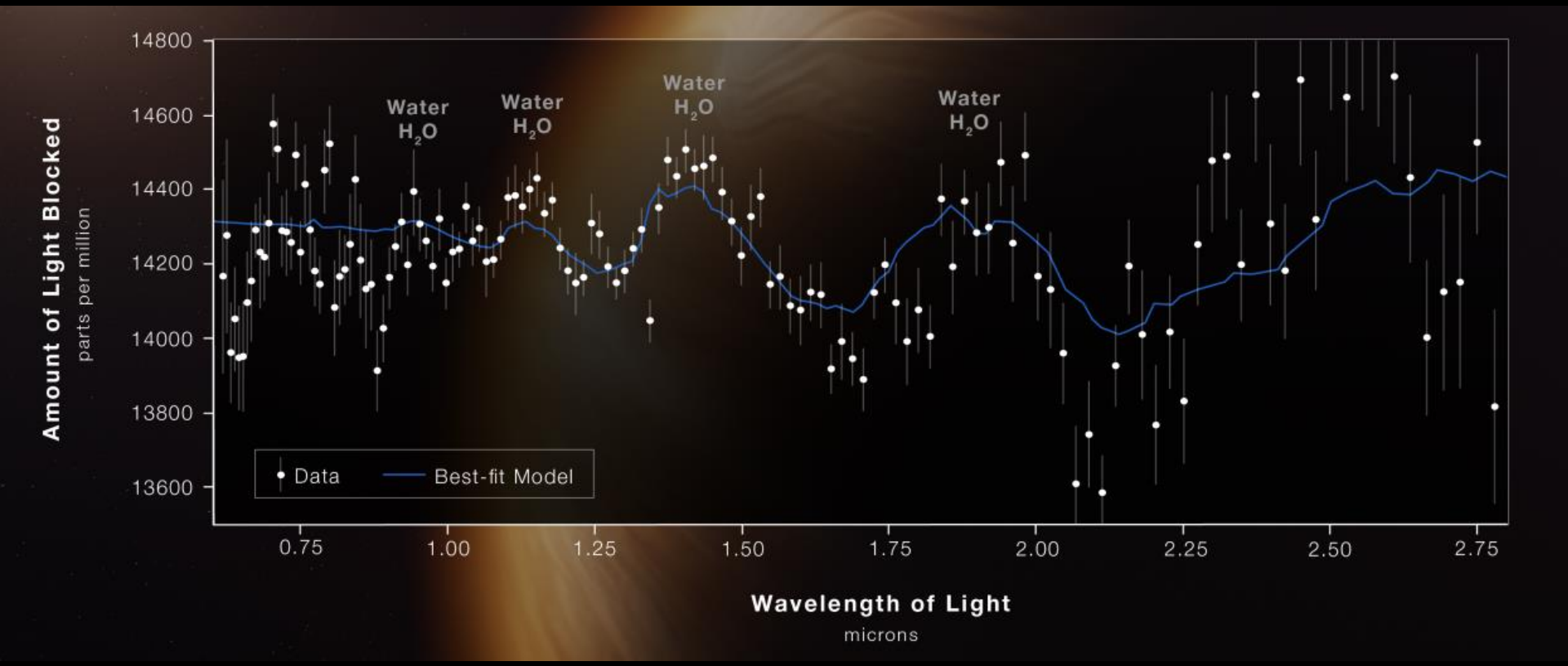


Jupiter et Europe

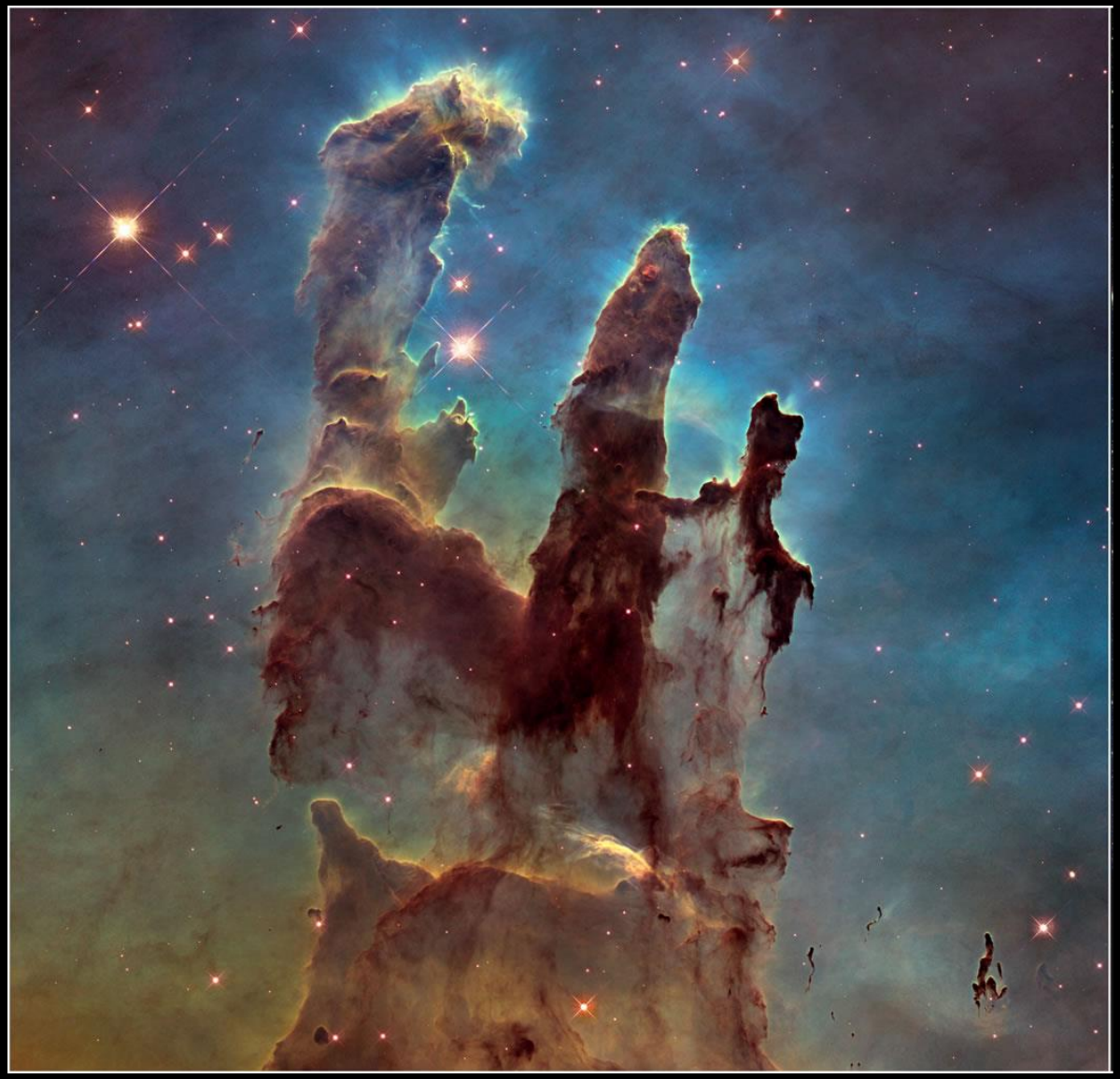
De la vie sur des exoplanètes…?



Spectre de l'atmosphère d'une exo-planète similaire à la Terre



Spectre de l'atmosphère de l'exo-planète WASP-96b (1000 a.l.)



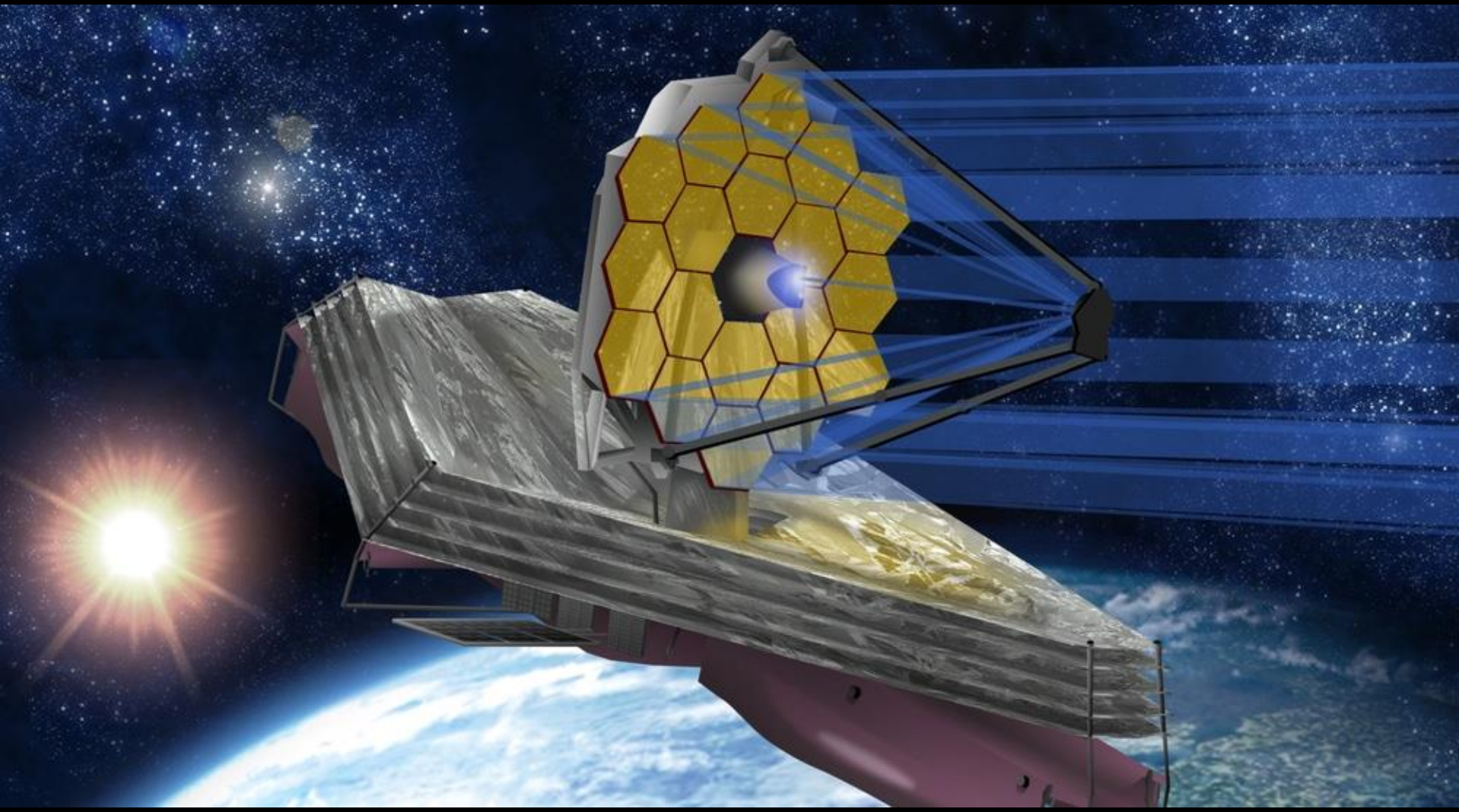
Nébuleuse de l’Aigle (Hubble)

Nébuleuse de l’Aigle

Nébuleuse de la Tête de Cheval
1500 a.l.

Hubble
James Webb

Le télescope spatial James Webb



Jean-Noël Sarrail – Pupenvol – 18 janvier 2023