



Our Place in the Universe

From Earth to the Stars

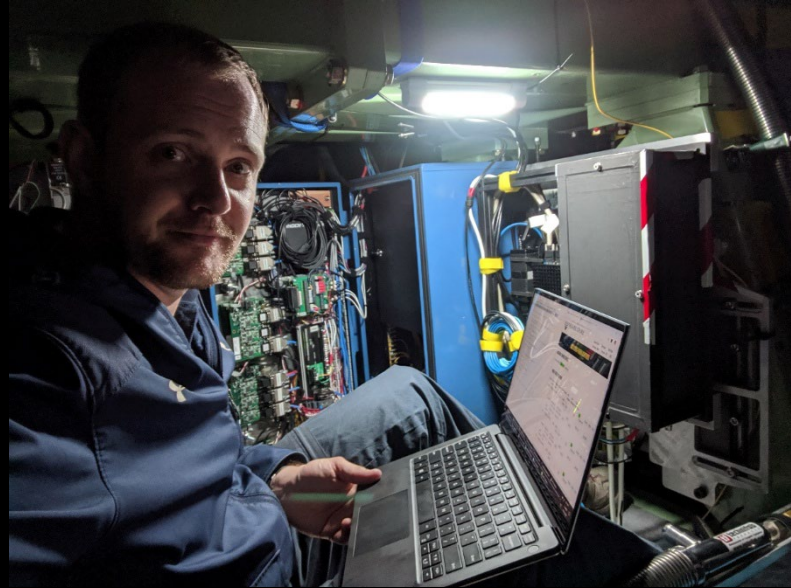
Dr Jonathan Crass



THE OHIO STATE
UNIVERSITY



Royal
Astronomical
Society









A night sky filled with stars and the Milky Way galaxy, with a dark, rocky landscape in the foreground. The Milky Way is visible as a bright, hazy band of light stretching across the sky, with a prominent orange and yellow glow on the right side. The foreground shows dark, jagged rock formations under a starry sky.

Where do we fit into the Universe?

How does the Universe change and evolve?

What makes up the Universe?

London

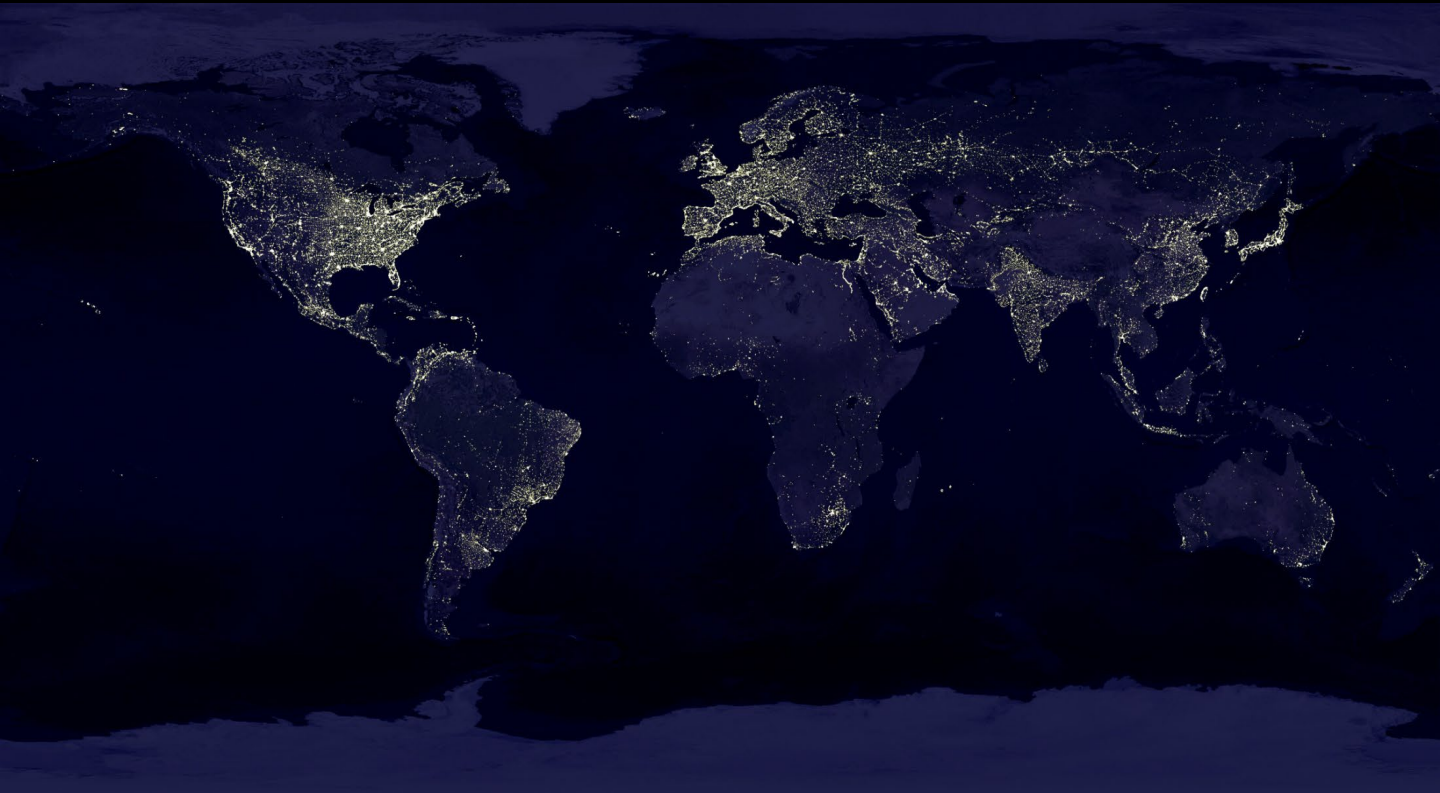




The United Kingdom



Europe



The Earth



The Earth



At the maximum speed of Queen Mary 2 (35mph):

- Southampton to New York: 4 days
- Earth to the Moon: 284 days
- Earth to the Sun: 302 years
- To the edge of the Solar System: 29,334 years



At the speed of light:

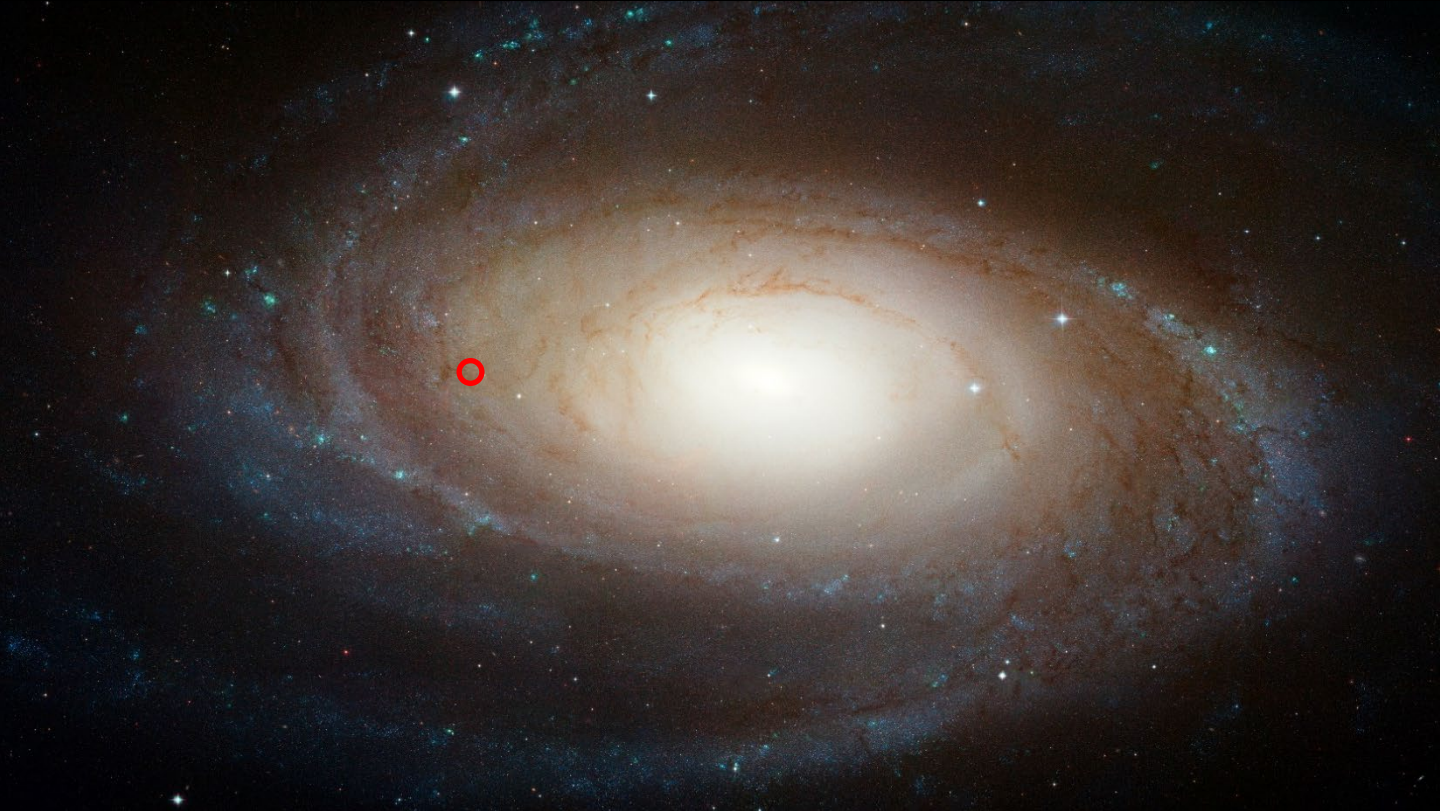
- Southampton to New York: 0.018 seconds
- Earth to the Moon: 1.28 seconds
- Earth to the Sun: 8.3 minutes
- To the edge of the Solar System: 13.4 hours

1 Light Year (ly):

The distance light travels in 1 year

5,878,625,373,184 miles

9,460,528,410,000 km



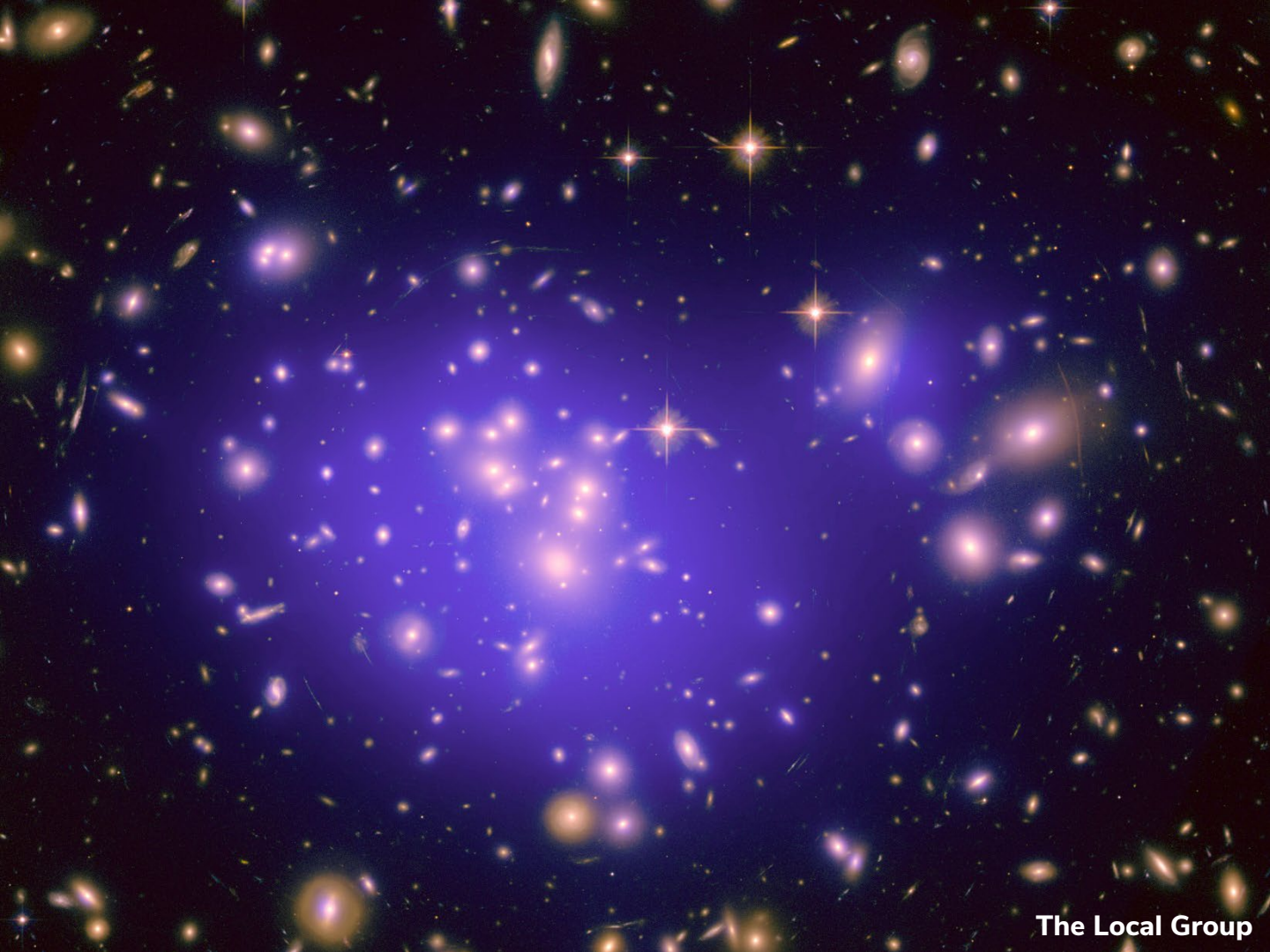
100,000 light years across

The Milky Way

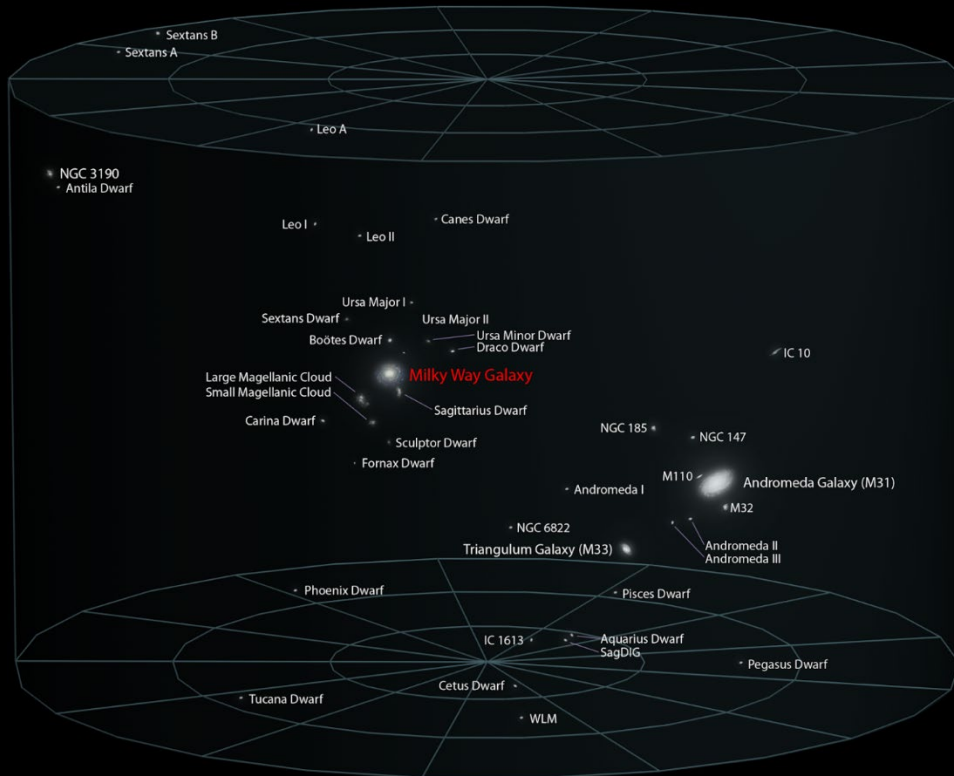


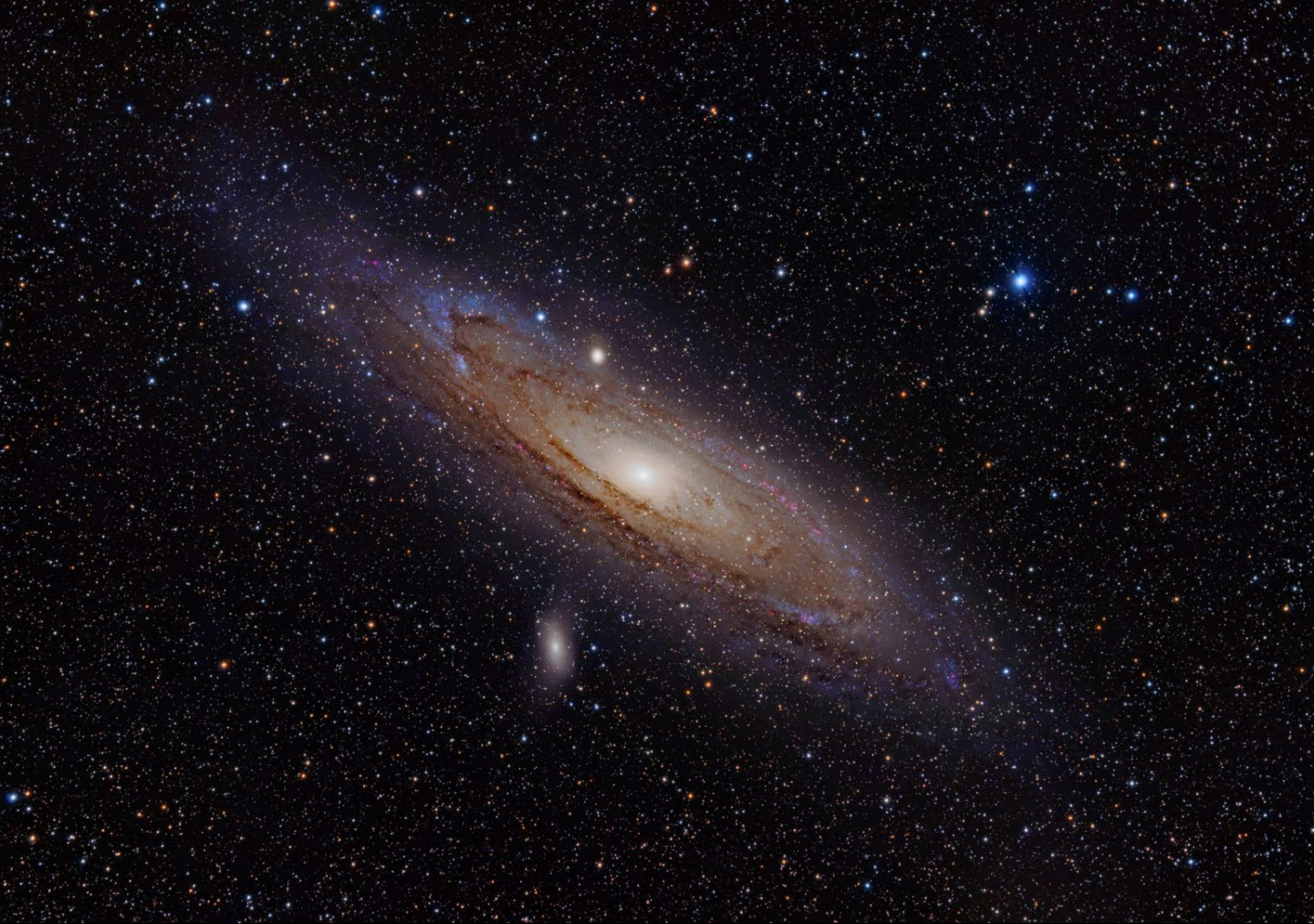


To Proxima Centauri: 4.23 light years

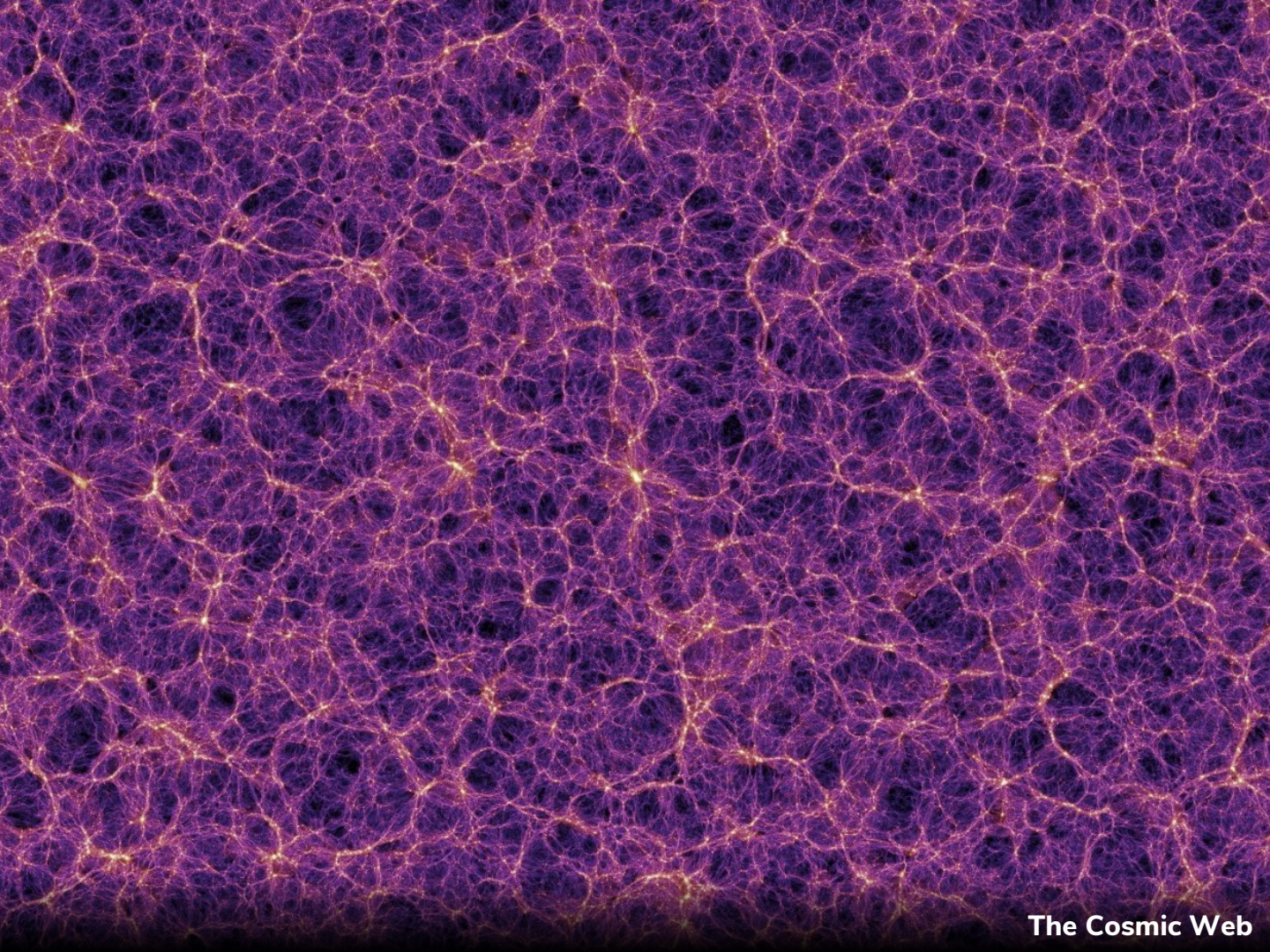


The Local Group

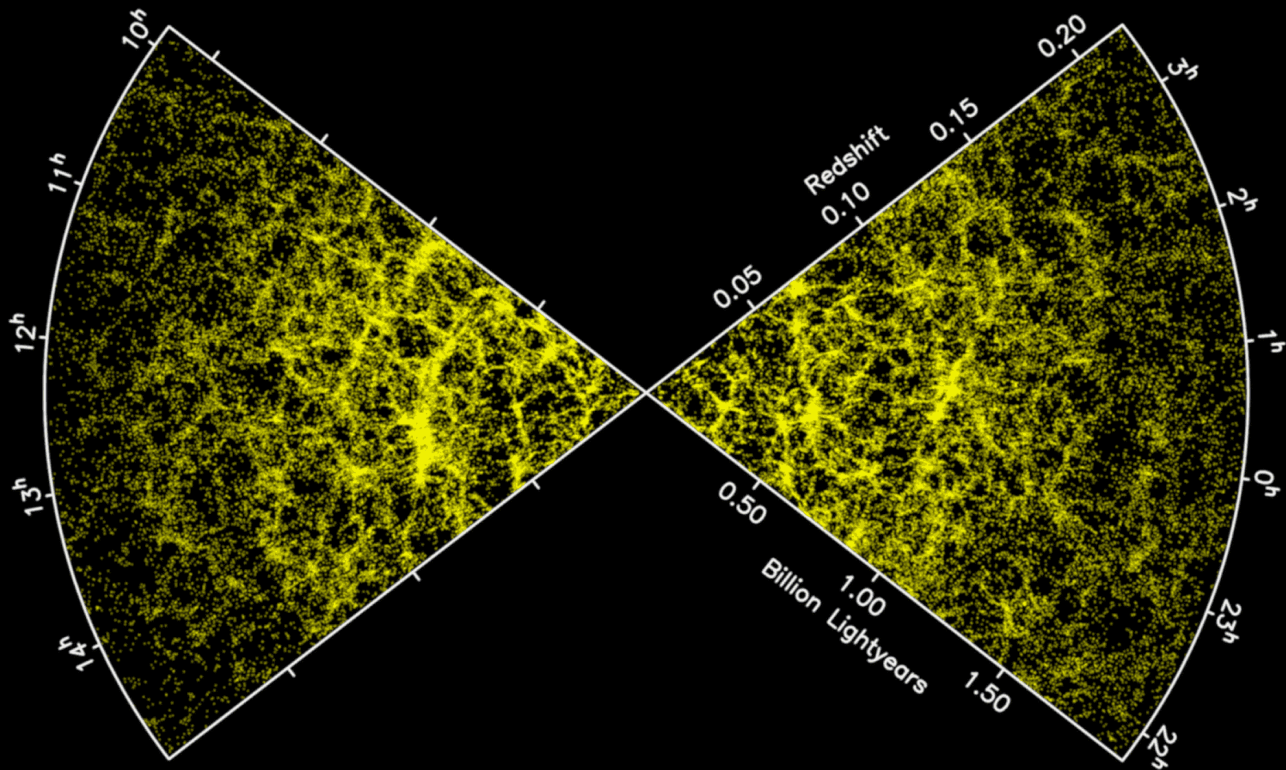




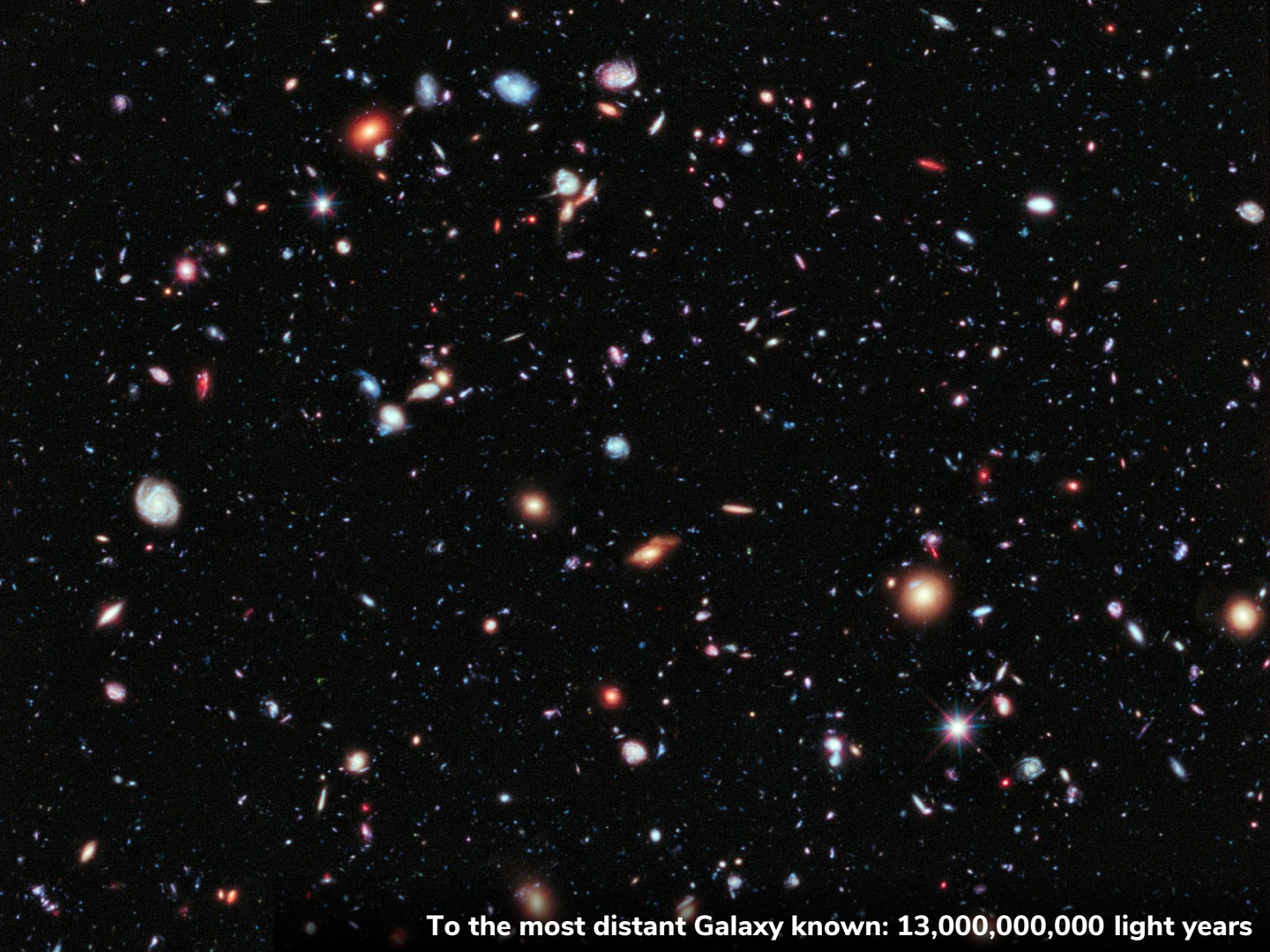
To the Andromeda Galaxy: 2,538,000 light years



The Cosmic Web



The Cosmic Web/The Universe



To the most distant Galaxy known: 13,000,000,000 light years

So just where are we?



CUNARD

Earth Address

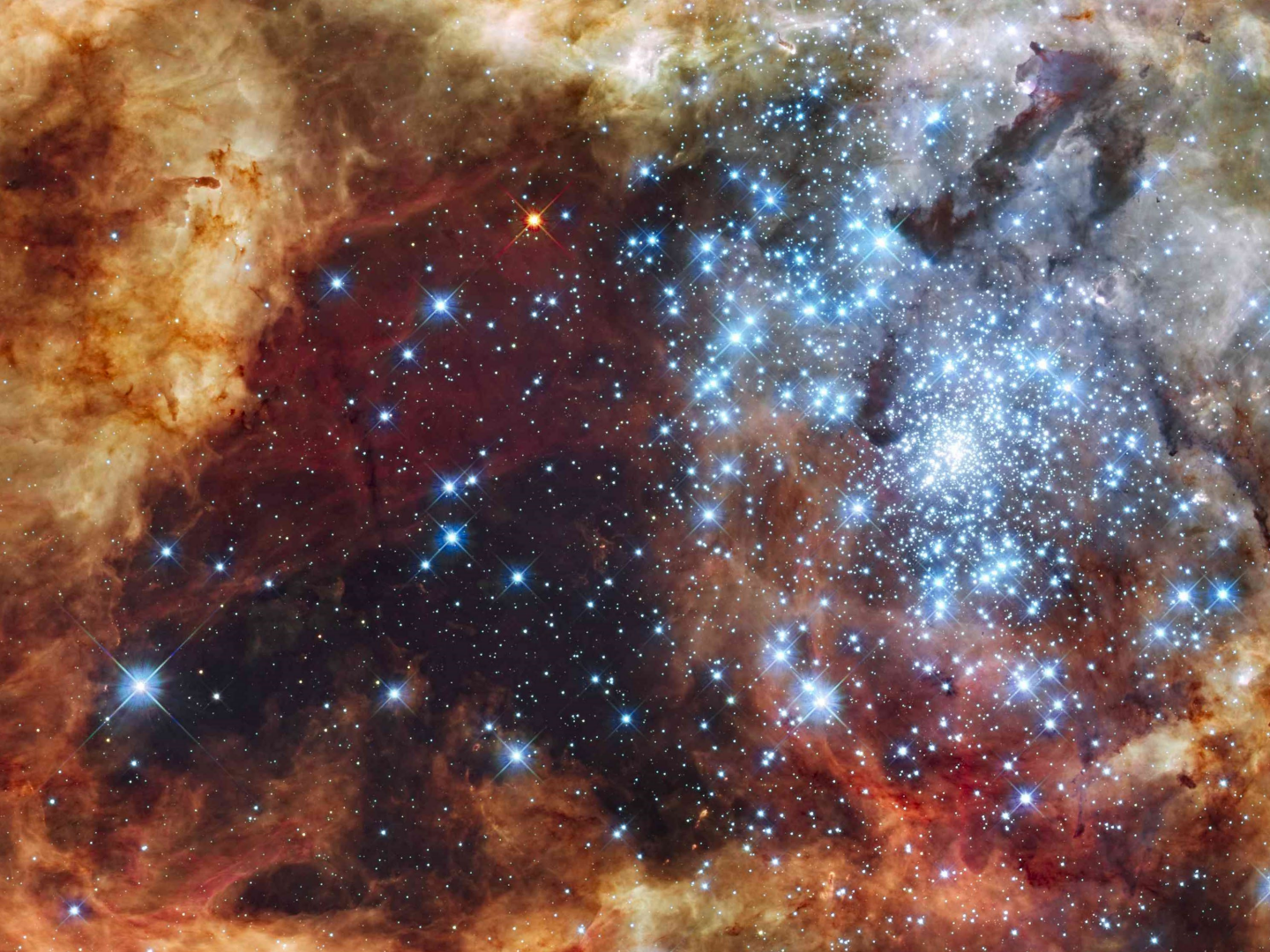
Cunard Line,
Southampton,
Hampshire,
United Kingdom,
Europe,
The Earth

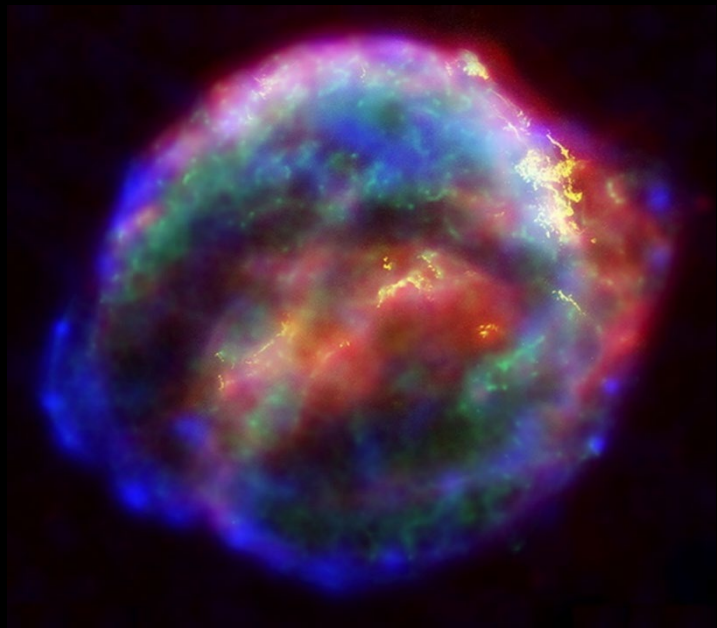
Universe Address

Cunard Line,
The Earth,
The Solar System,
The Milky Way,
The Local Group,
The Universe



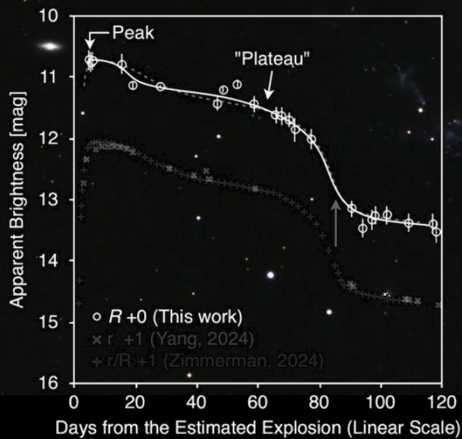
The changing and evolving Universe



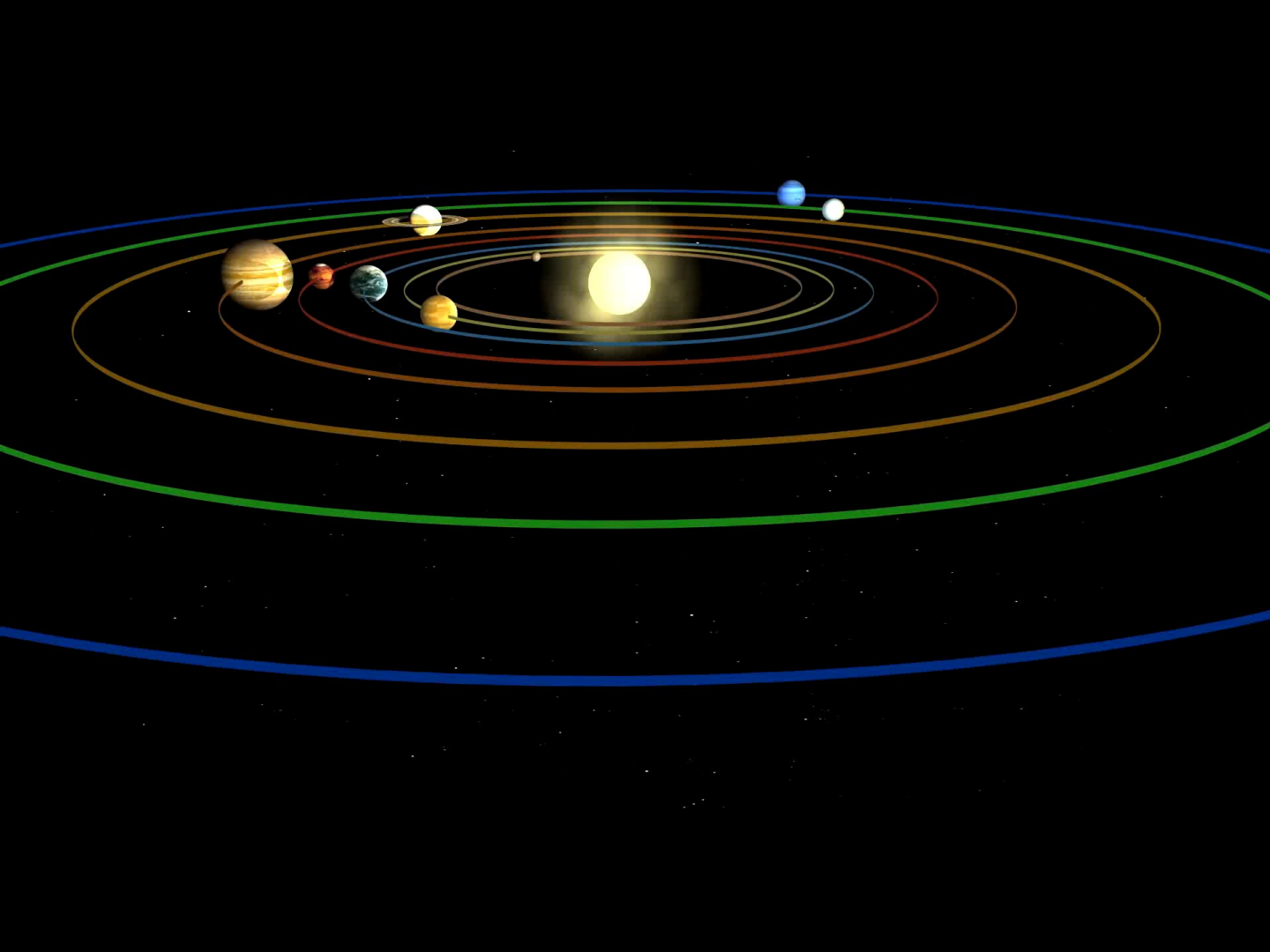


Galaxy M101

April 21, 2023



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alpha Persei



Pleiades

Orion

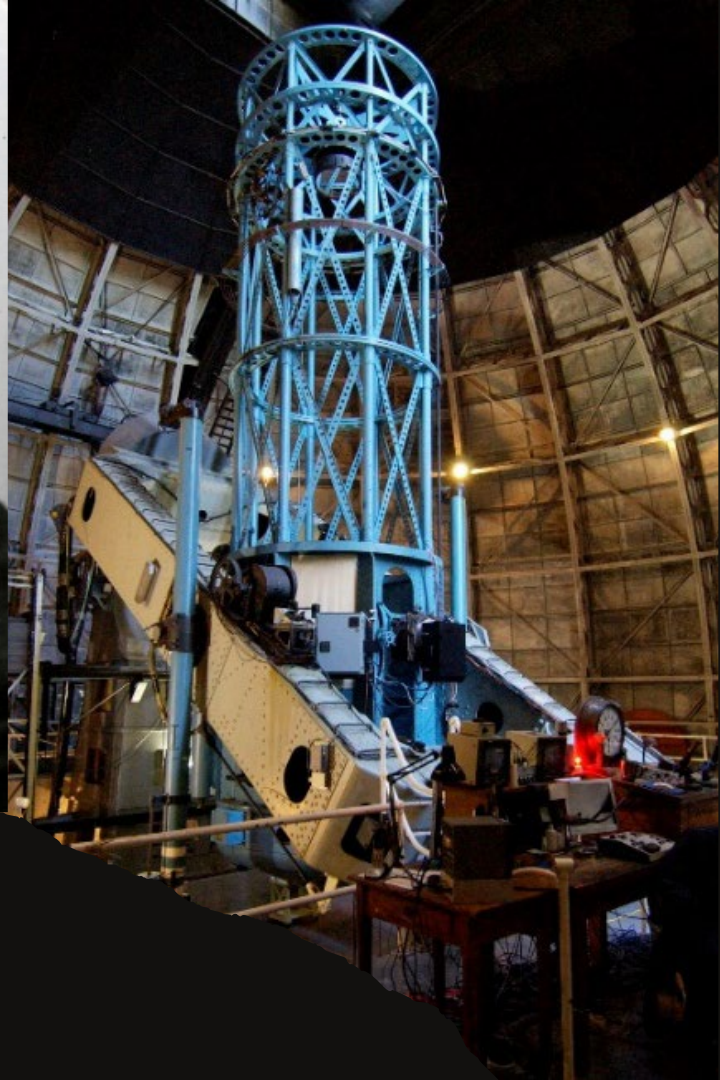






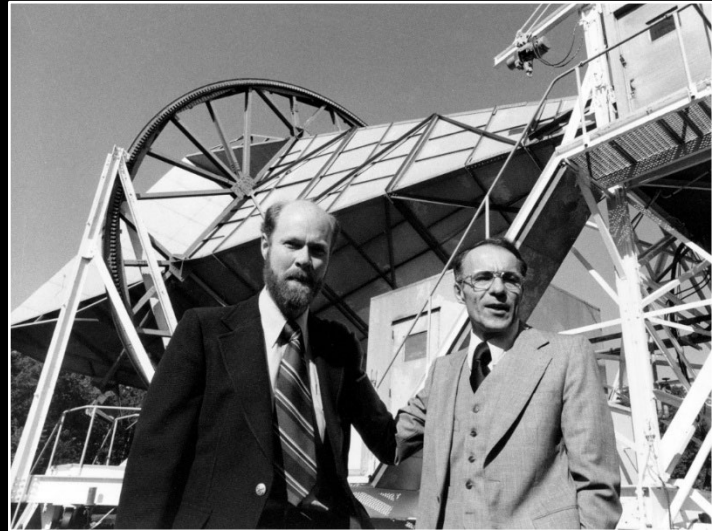
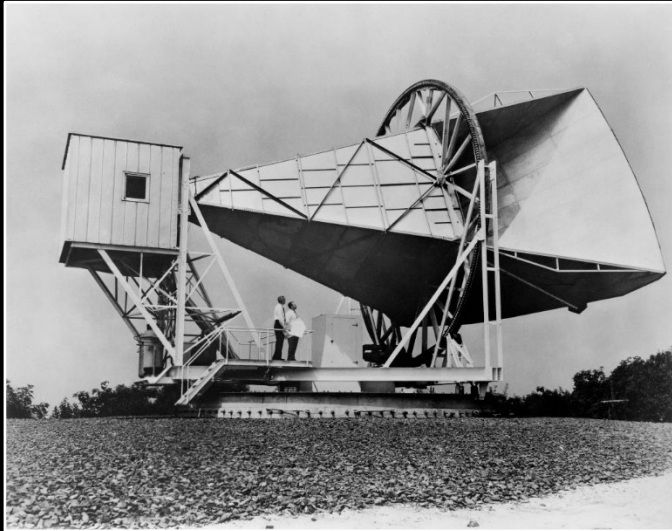


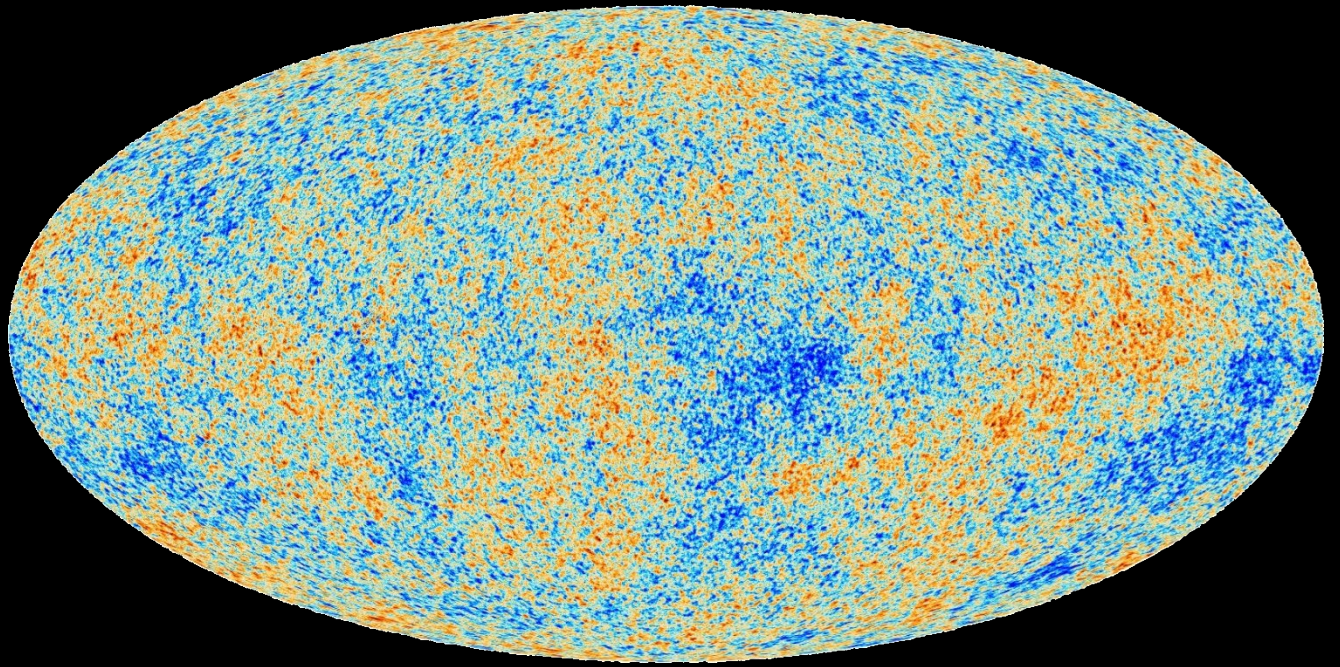




The moving galaxies

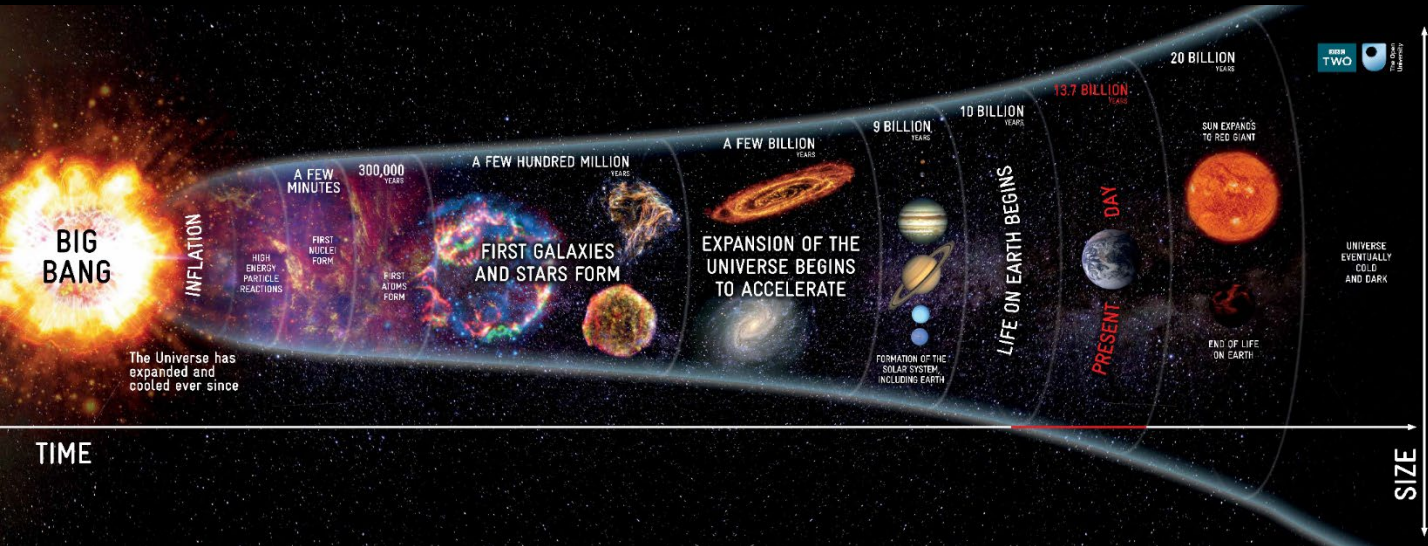
The Cosmic Microwave Background



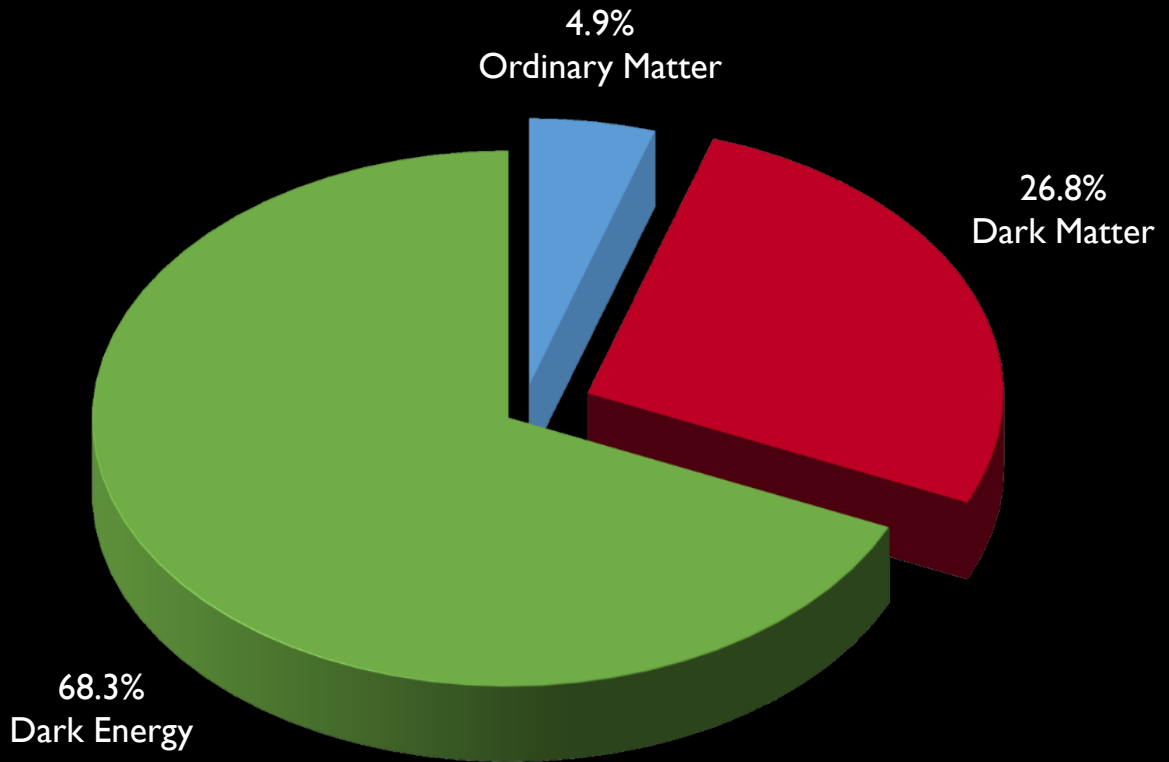


The Cosmic Microwave Background - Observable Universe

The Big Bang



The Universe of Today





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