The background of the slide is a deep space image featuring a dense field of stars and a large, glowing galaxy in the center. The galaxy has a bright yellowish-white core and a diffuse, blue and white outer structure. The surrounding space is filled with numerous small, bright stars of varying colors.

**Cosmic Connections:  
An Introduction to Astronomy  
and  
Maine's Magnificent Night  
Skies**

Midcoast Senior College  
Russell F. Pinizzotto, Ph.D. (Russ)

**Unit 13**

**Galaxies**

# The Great Debate – 25 April 1920

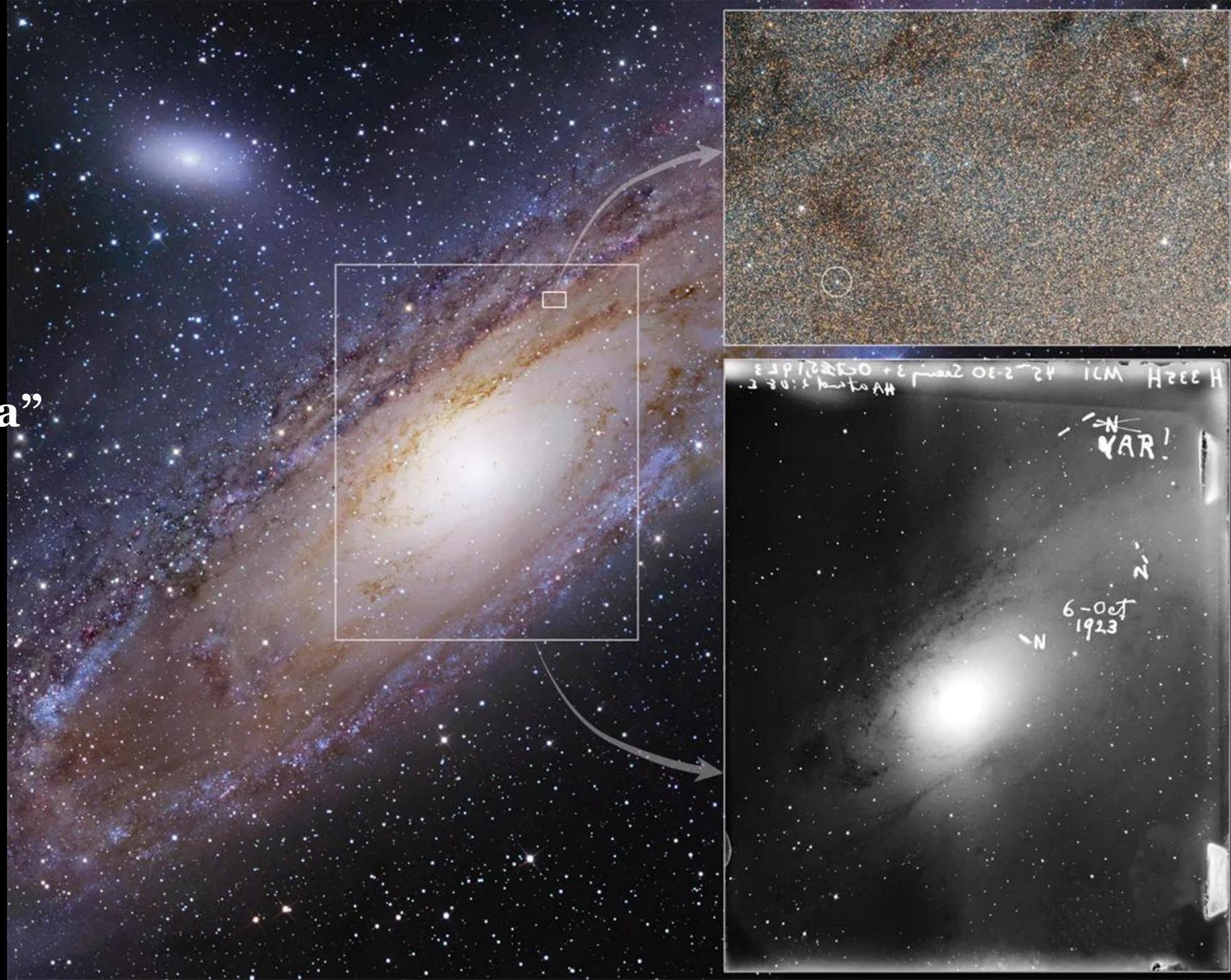
Shapley

Curtis

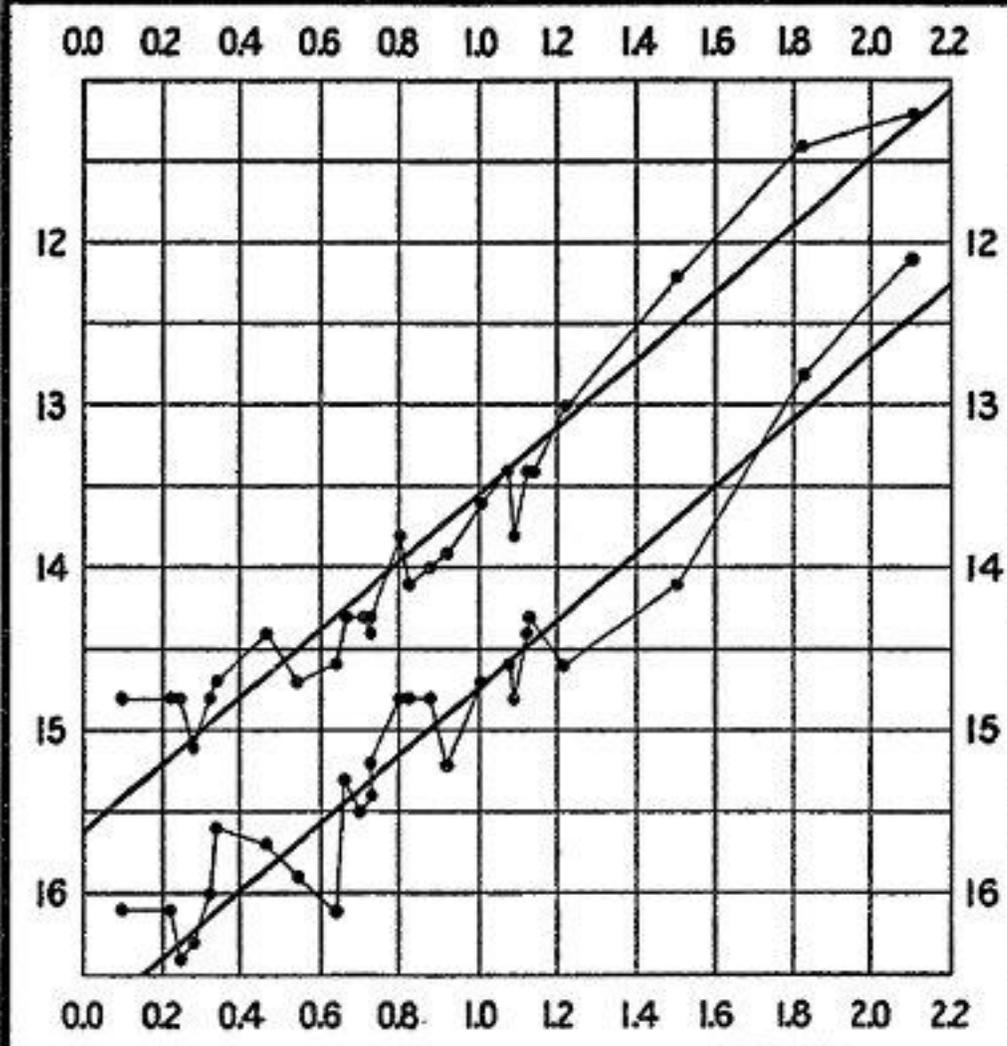


Hubble shows  
Andromeda “Nebula”  
is millions of light  
years away!

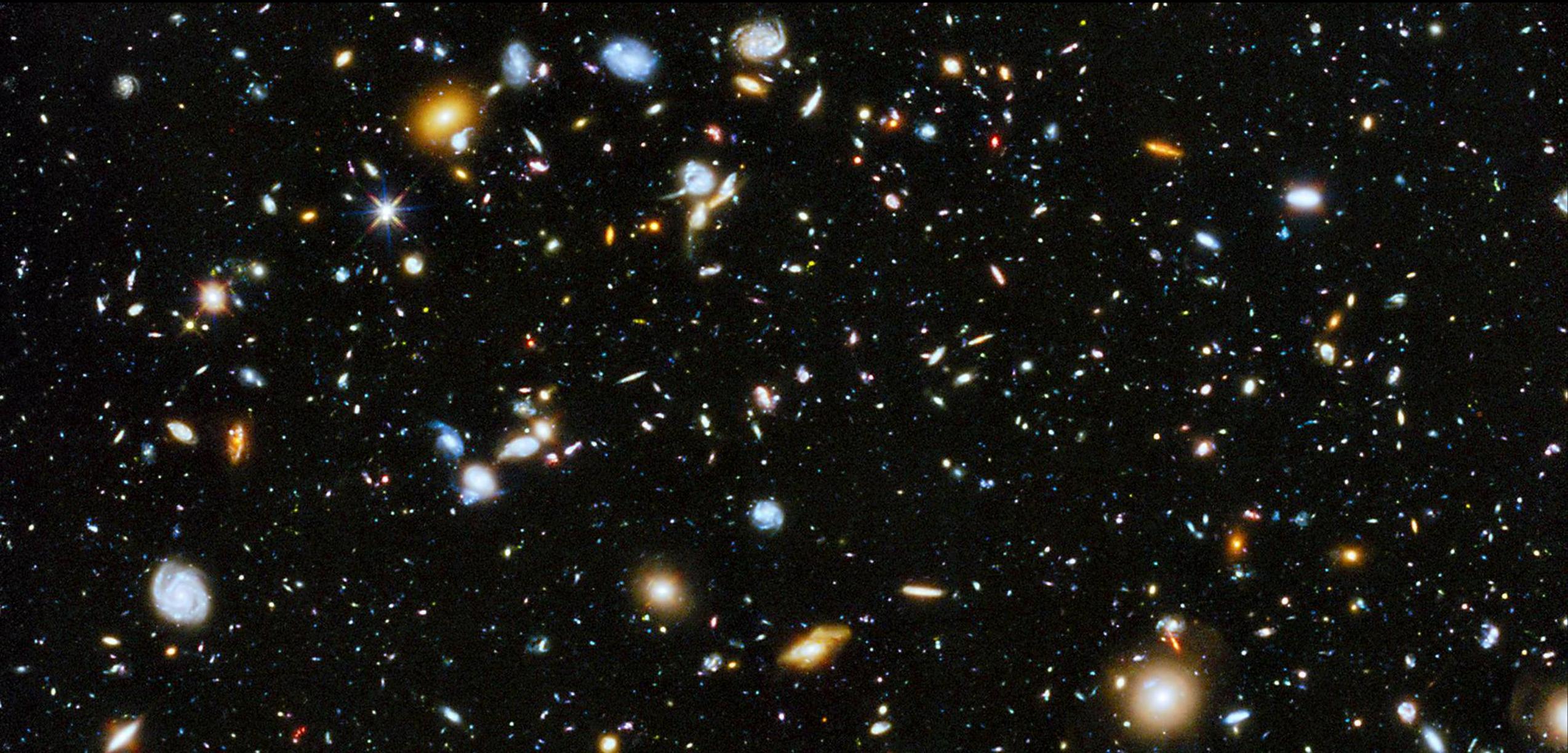
(1923)



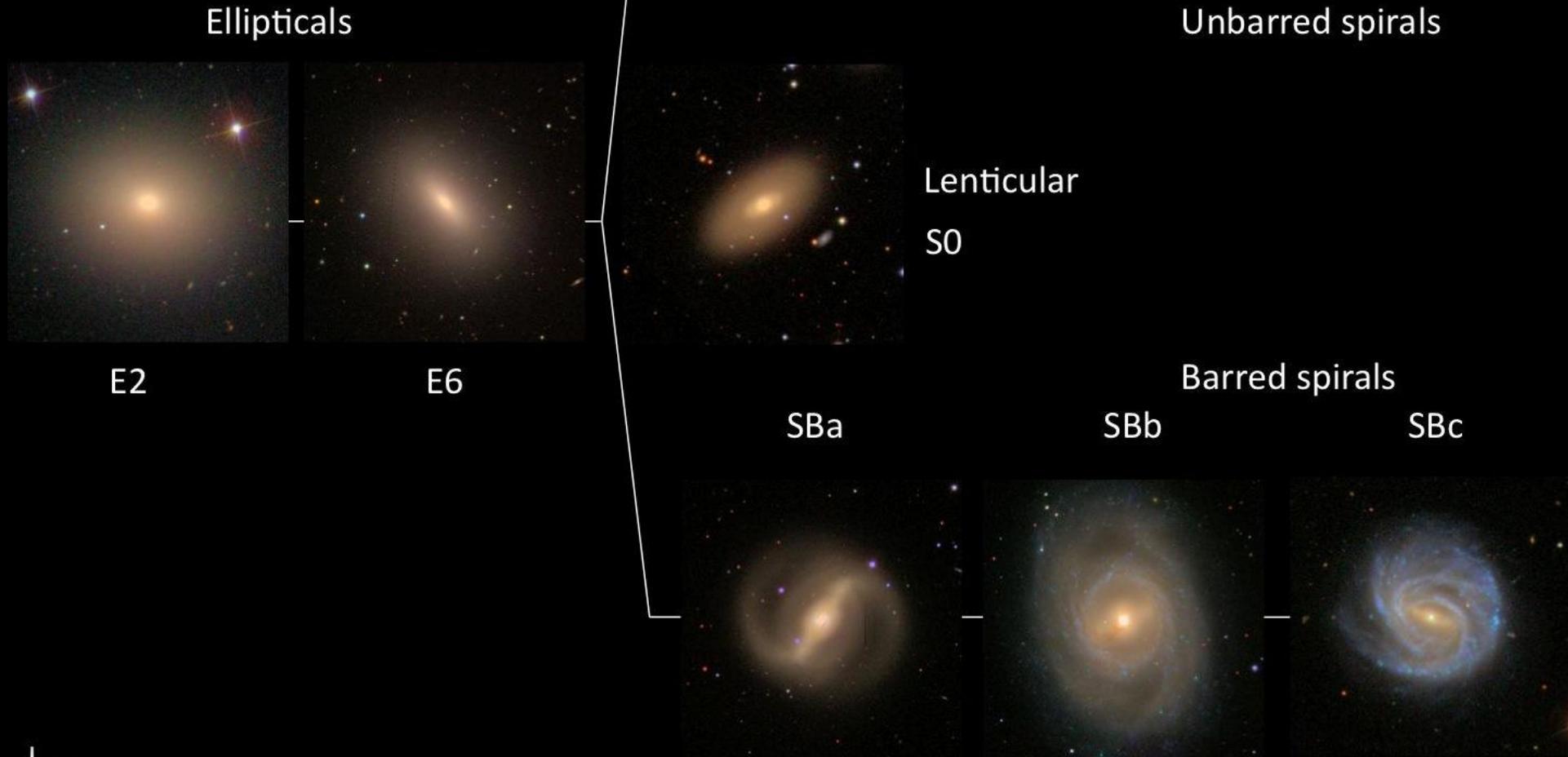
# Henrietta Leavitt and Cepheid Variable Stars

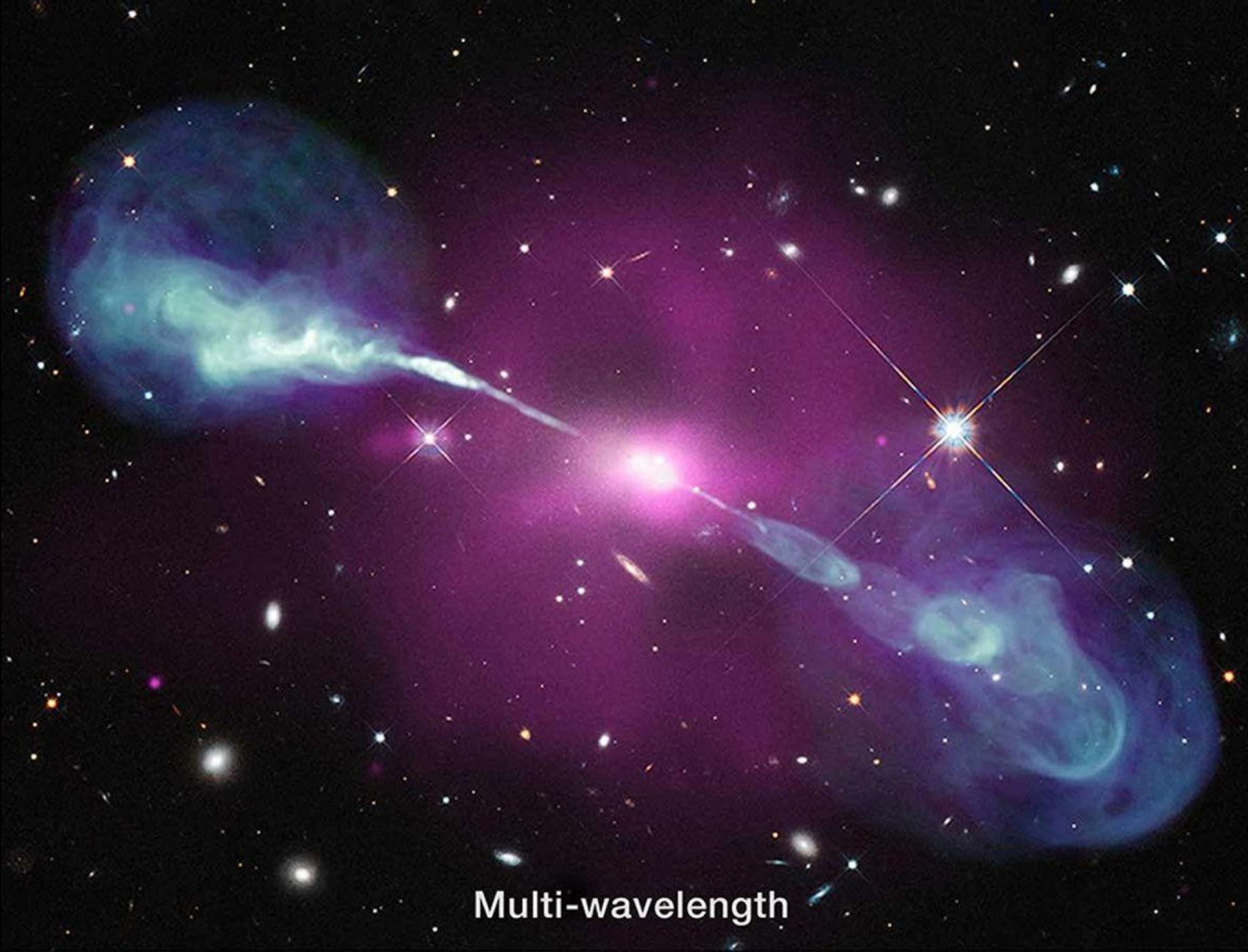


HST Ultra Deep Field – 2,000,000,000,000 galaxies in our Universe



# The Hubble Tuning Fork





Multi-wavelength



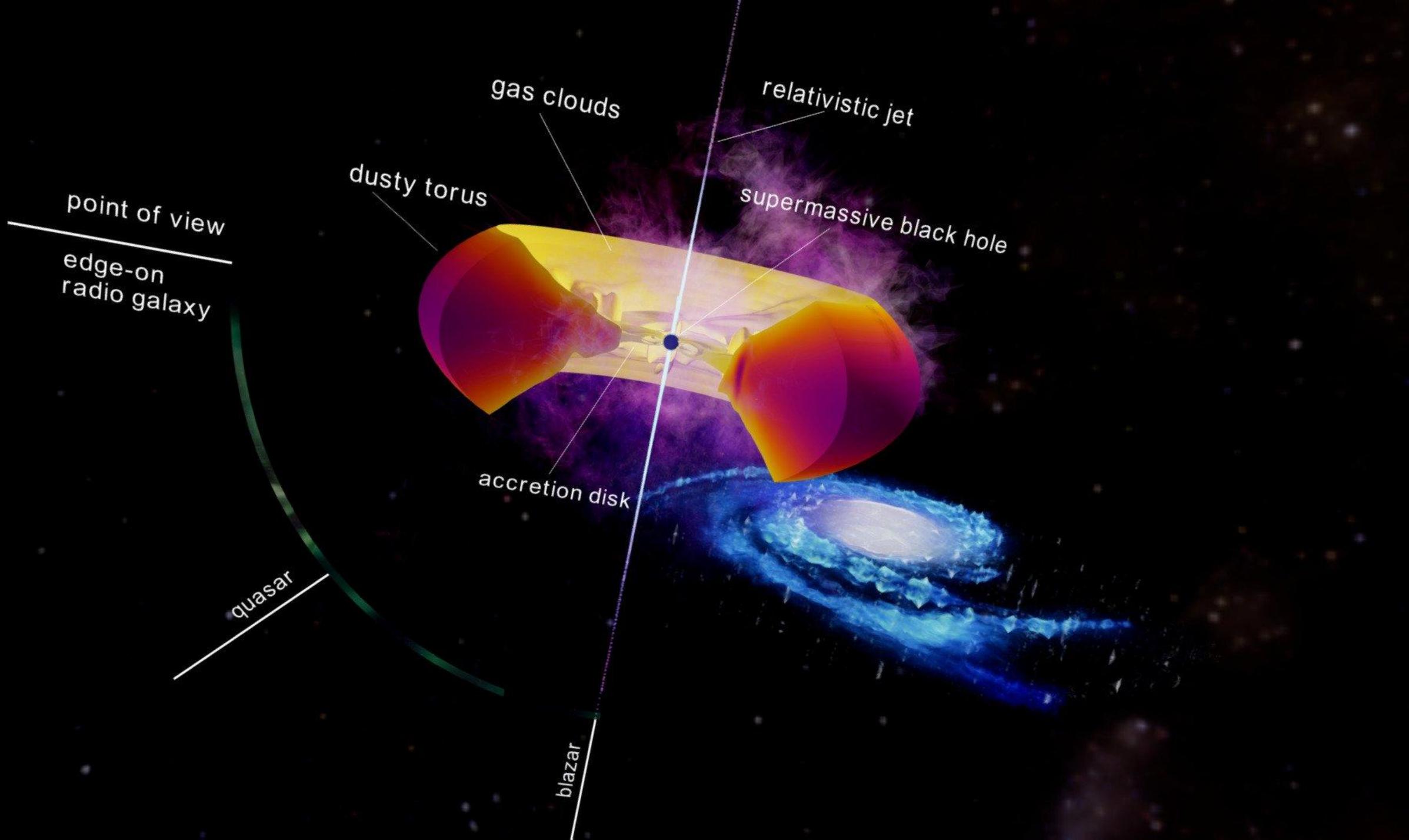
Visible Light

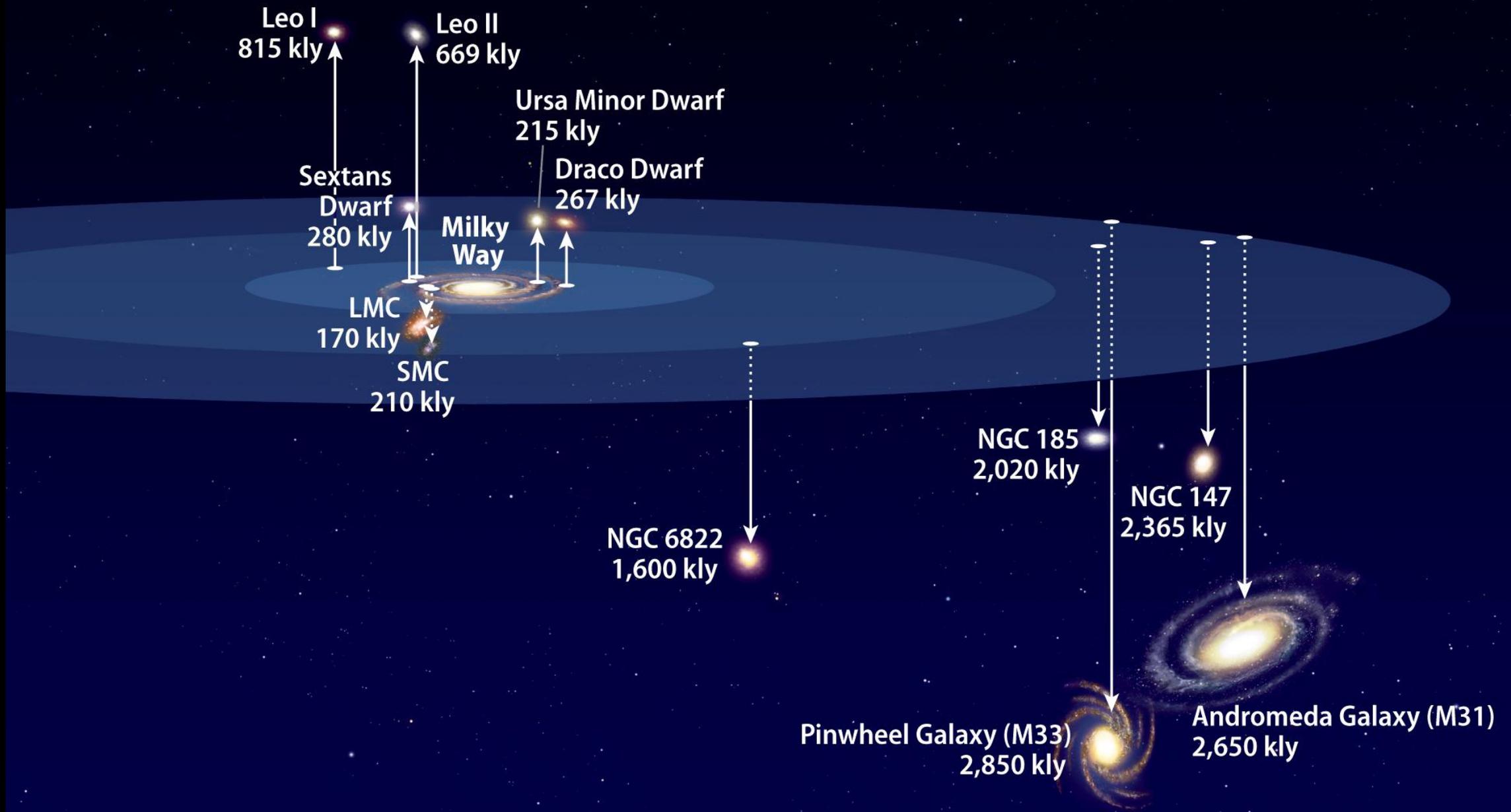


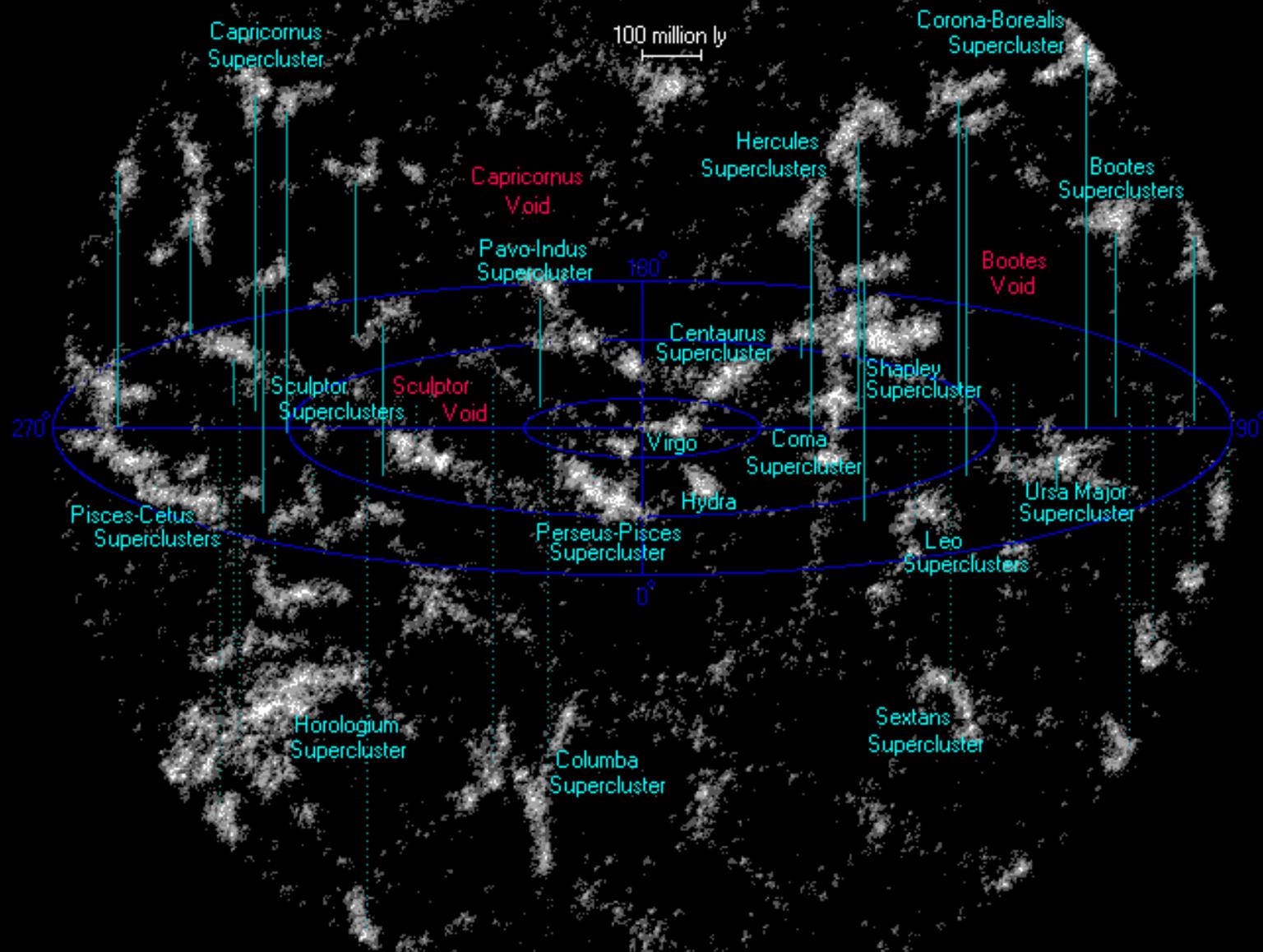
X-ray Light

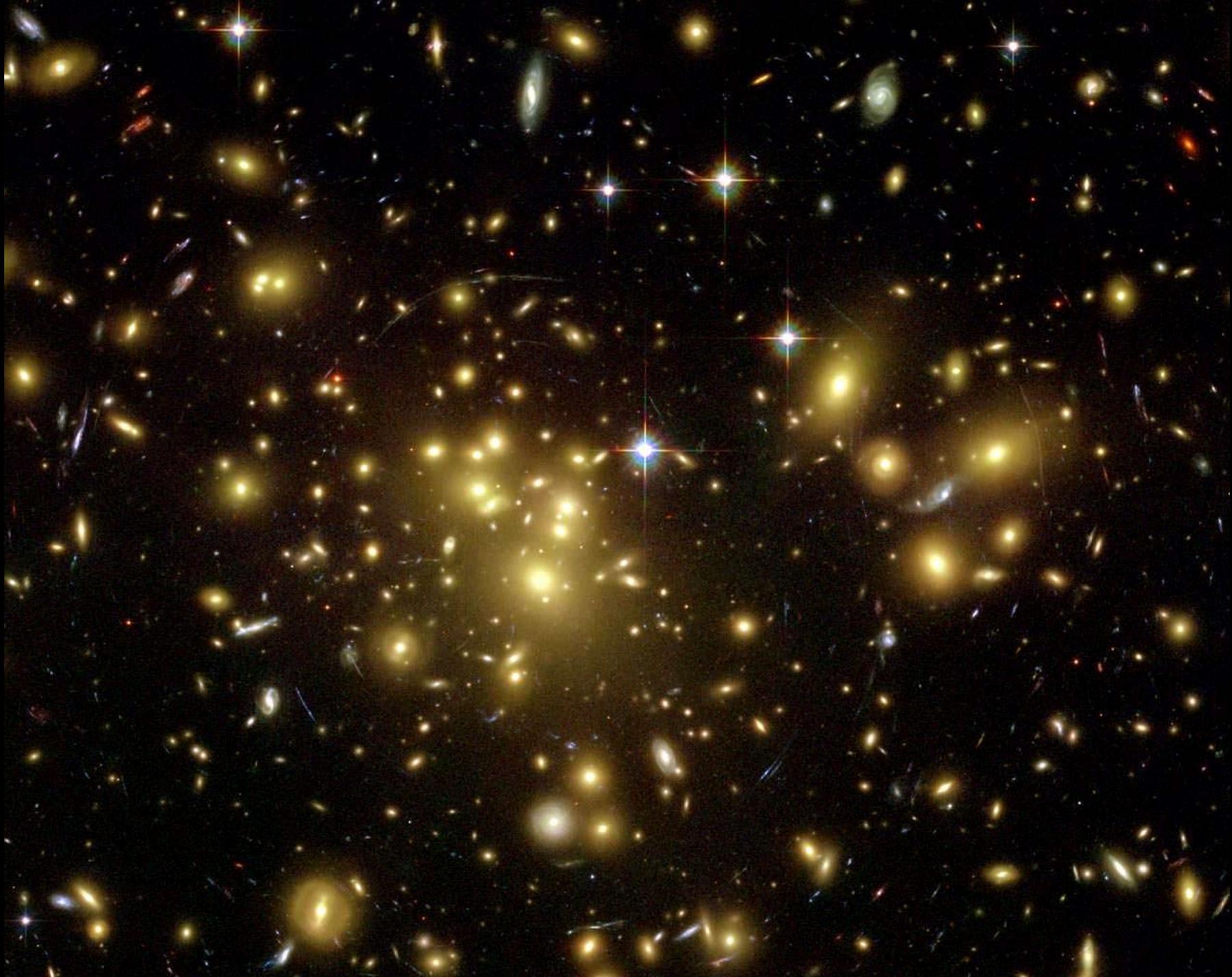


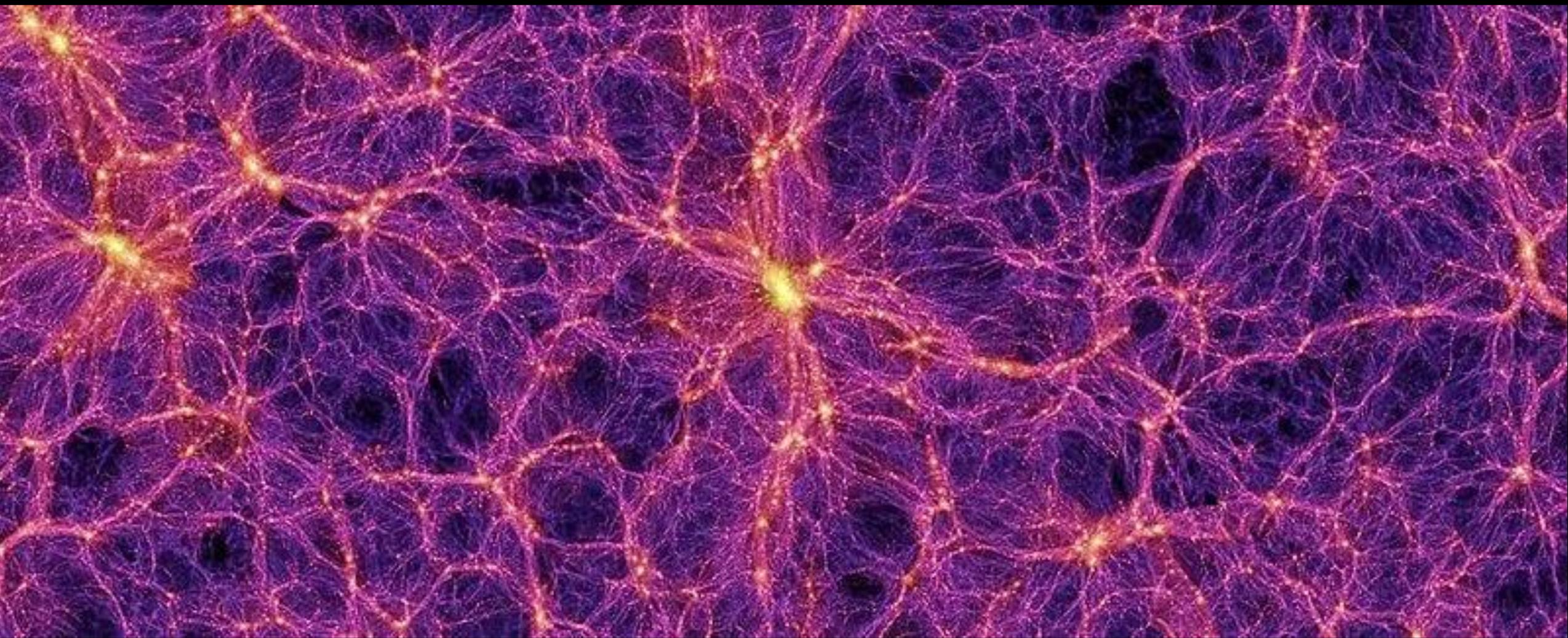
Radio Light

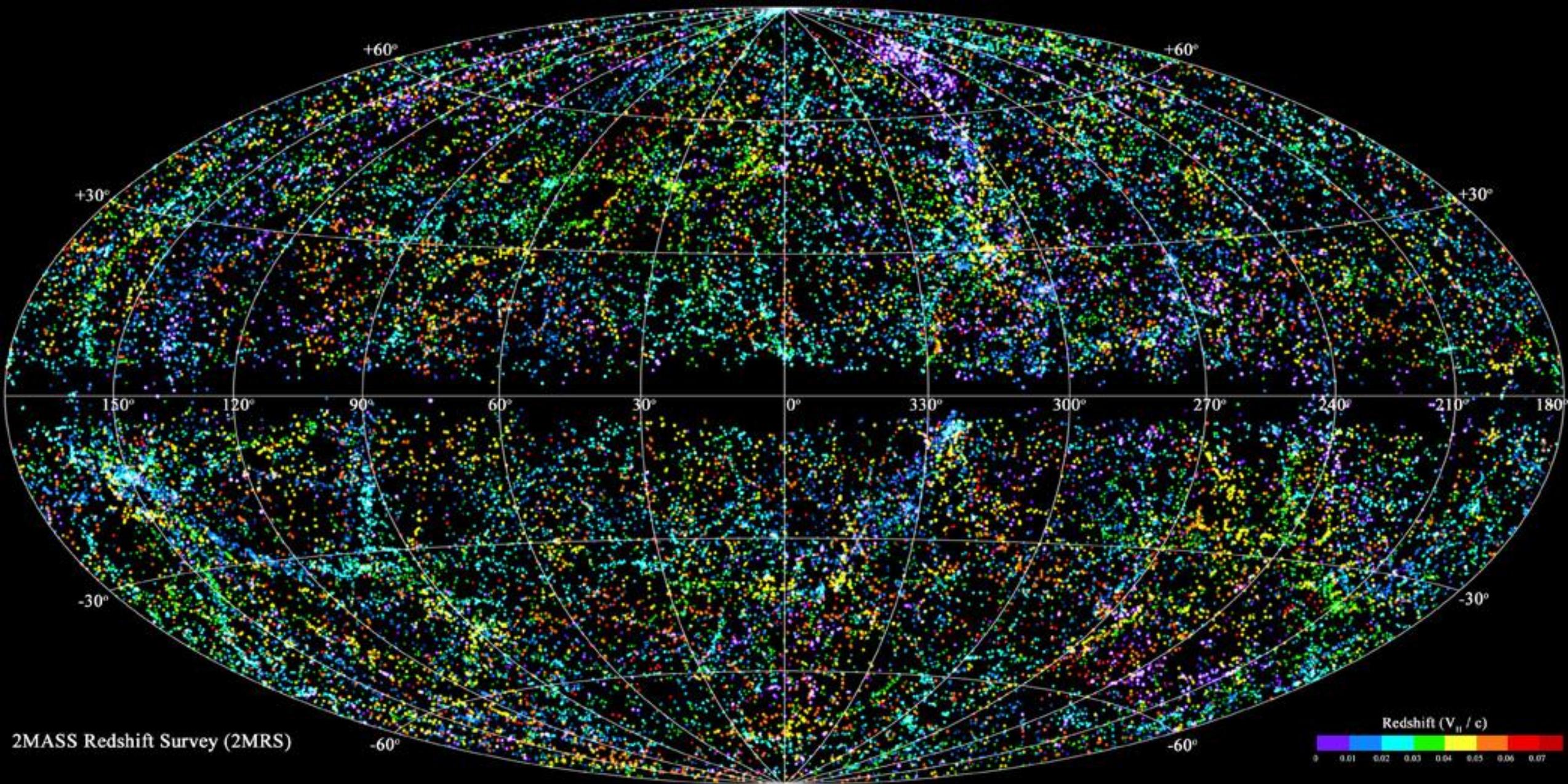








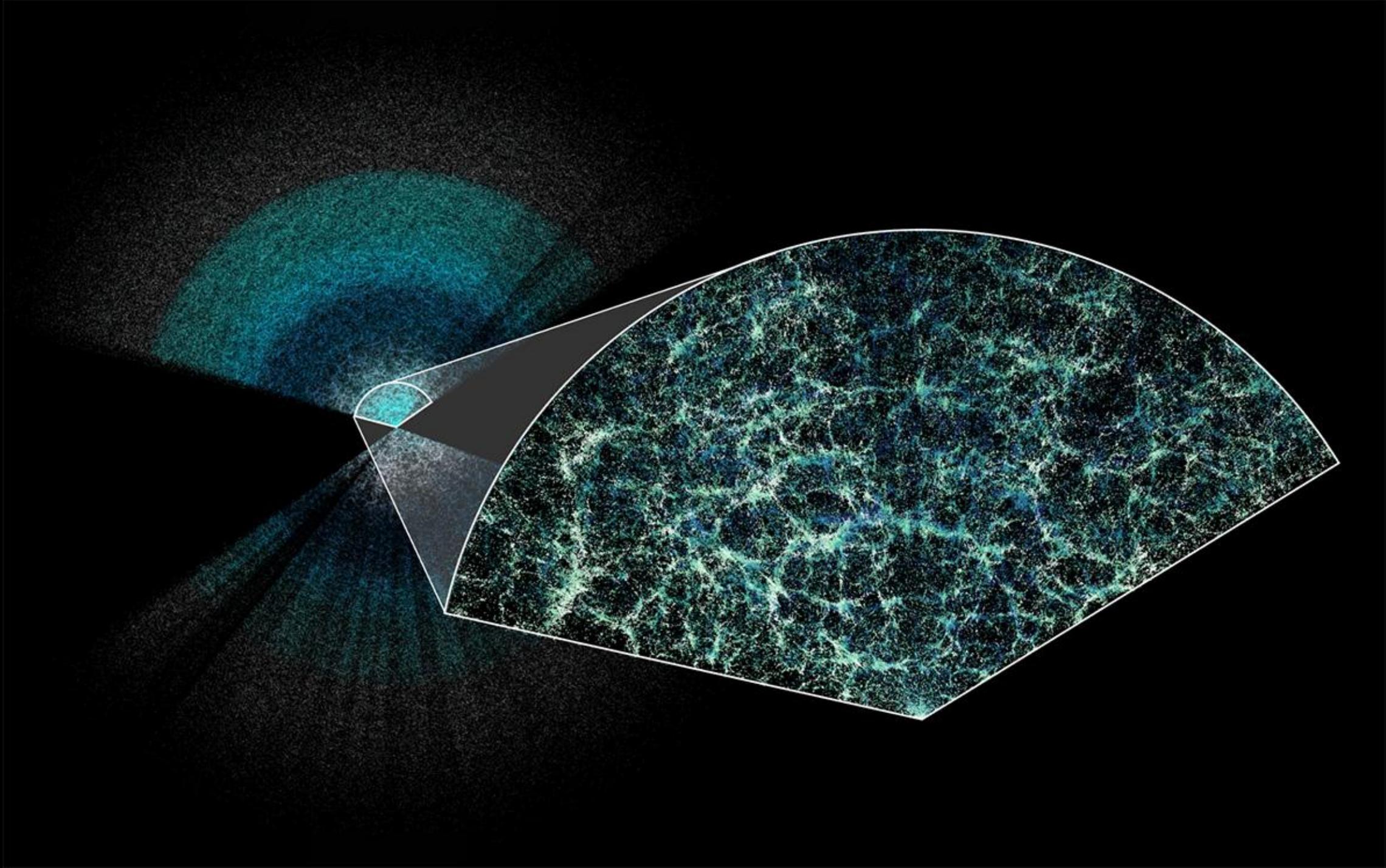




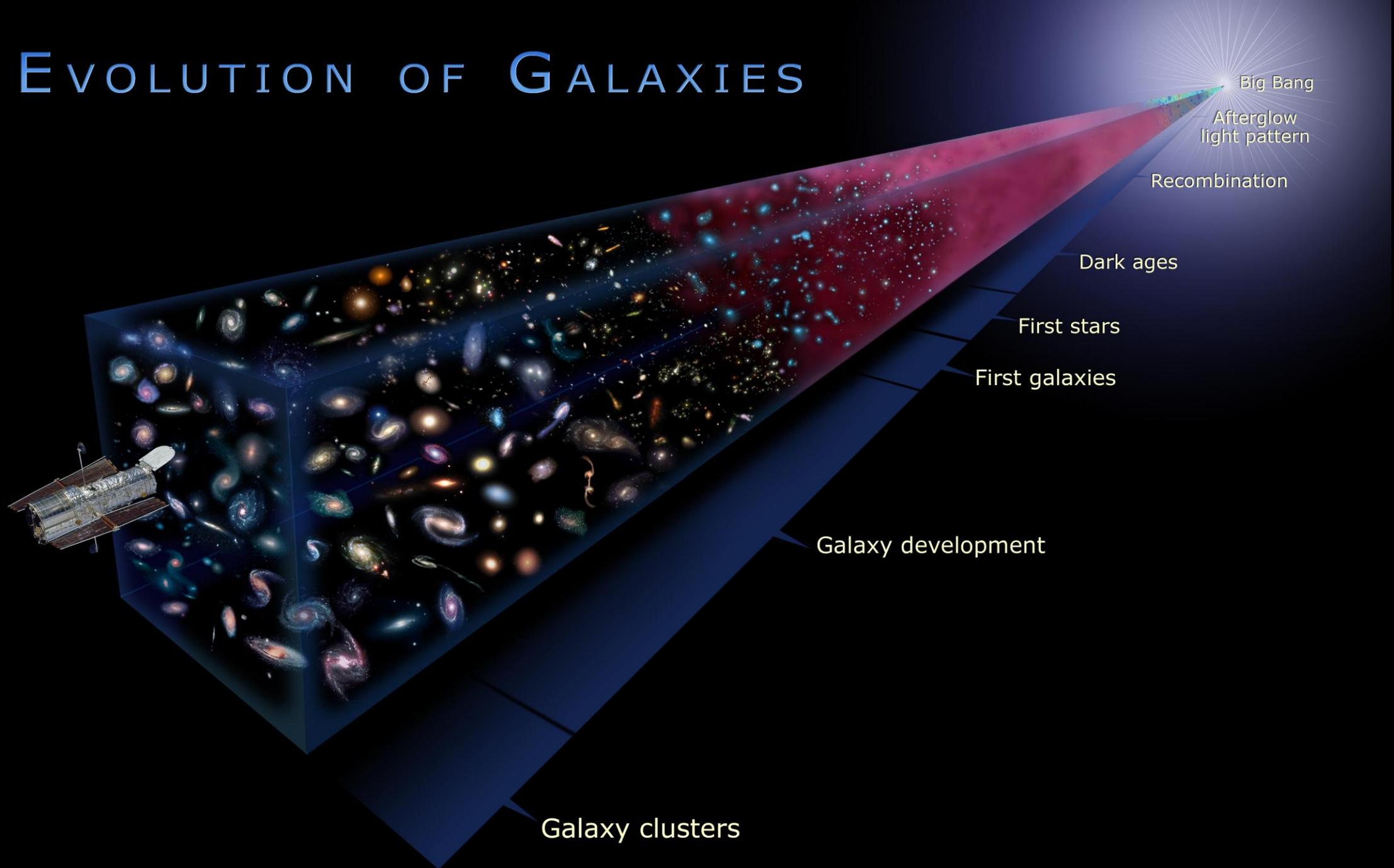
2MASS Redshift Survey (2MRS)

Redshift ( $V_n / c$ )

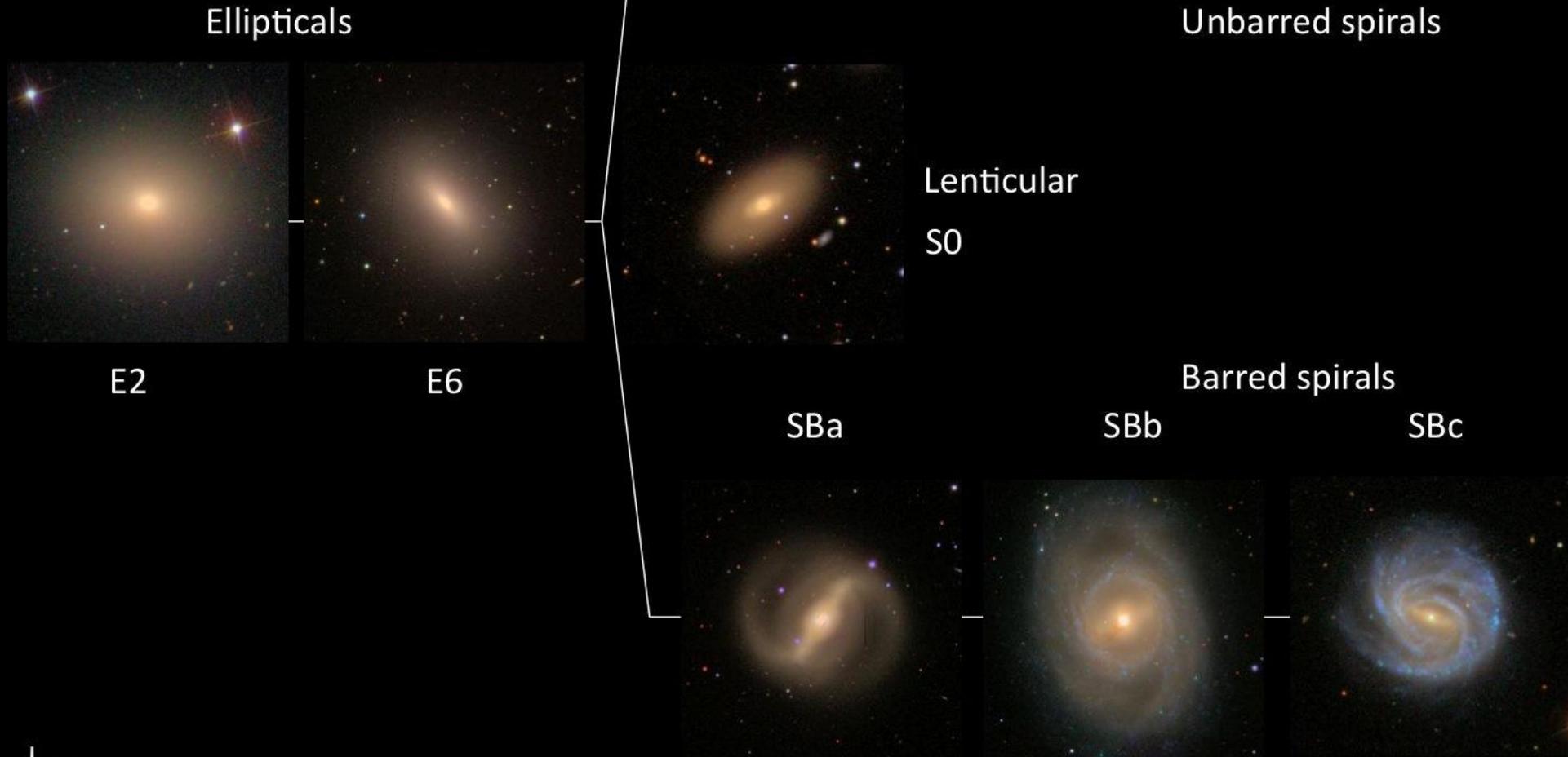




# EVOLUTION OF GALAXIES



# The Hubble Tuning Fork



Galaxy Collisions

Galaxy Mergers

Galaxy Cannibalism

