
Hubble
Telescope

Hubble Deep Field

A galaxy is an assembly of between a billion and a hundred billion stars. In addition to stars, there is often a large amount of dust and gas, all held together by gravity.

The Sun and the Earth are in the Milky Way Galaxy.

Stars

- Massive, gaseous bodies that undergo nuclear fusion and emit light. The "spikes" in the pictures are caused by telescope distortion.

Galaxies

Spiral:

Spiral Galaxies

- Have two or more arms winding out from a central disk. Looks like a "fried egg" from the side. Contain blue/white color from recent star formation especially in the arms.

Elliptical:

Elliptical Galaxies

- Variety of shapes from round to flat. Smooth, featureless; contain yellow and red color because they do not contain young stars.

Irregular:

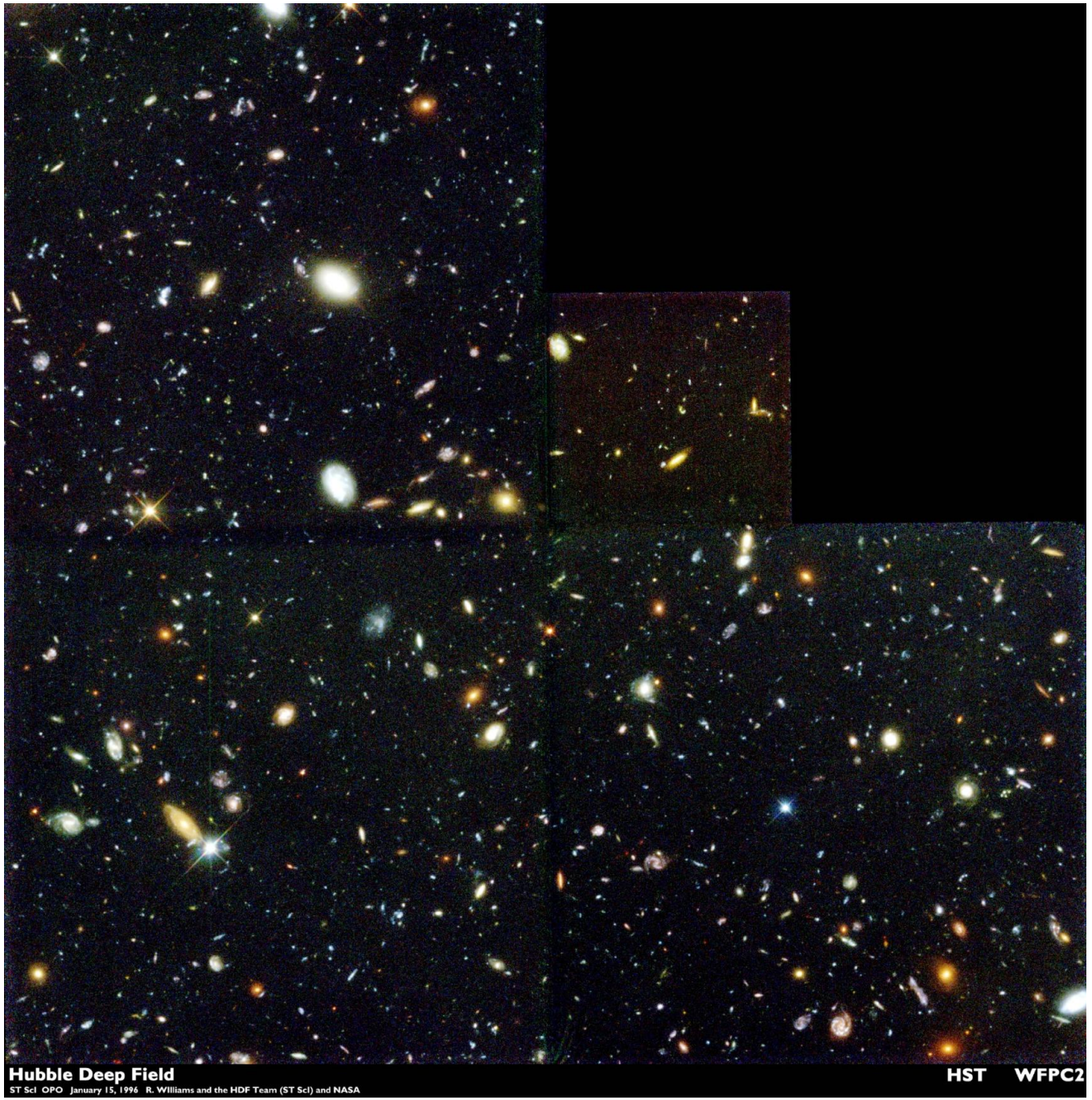
Irregular Galaxies

- Have stars, dust, and gases scattered in random patches. Blue or white because recent star formation makes these galaxies appear blue.

A picture of the Hubble Deep Field (HDF). The "deepest" image of the sky ever taken, it was made in 1996 using the Hubble Space Telescope by effectively leaving the shutter open for **11 consecutive days**.

Camera

A

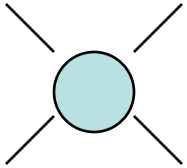
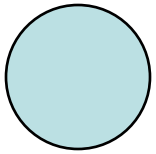
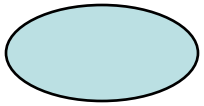
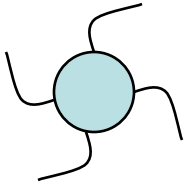


Camera

B

Camera

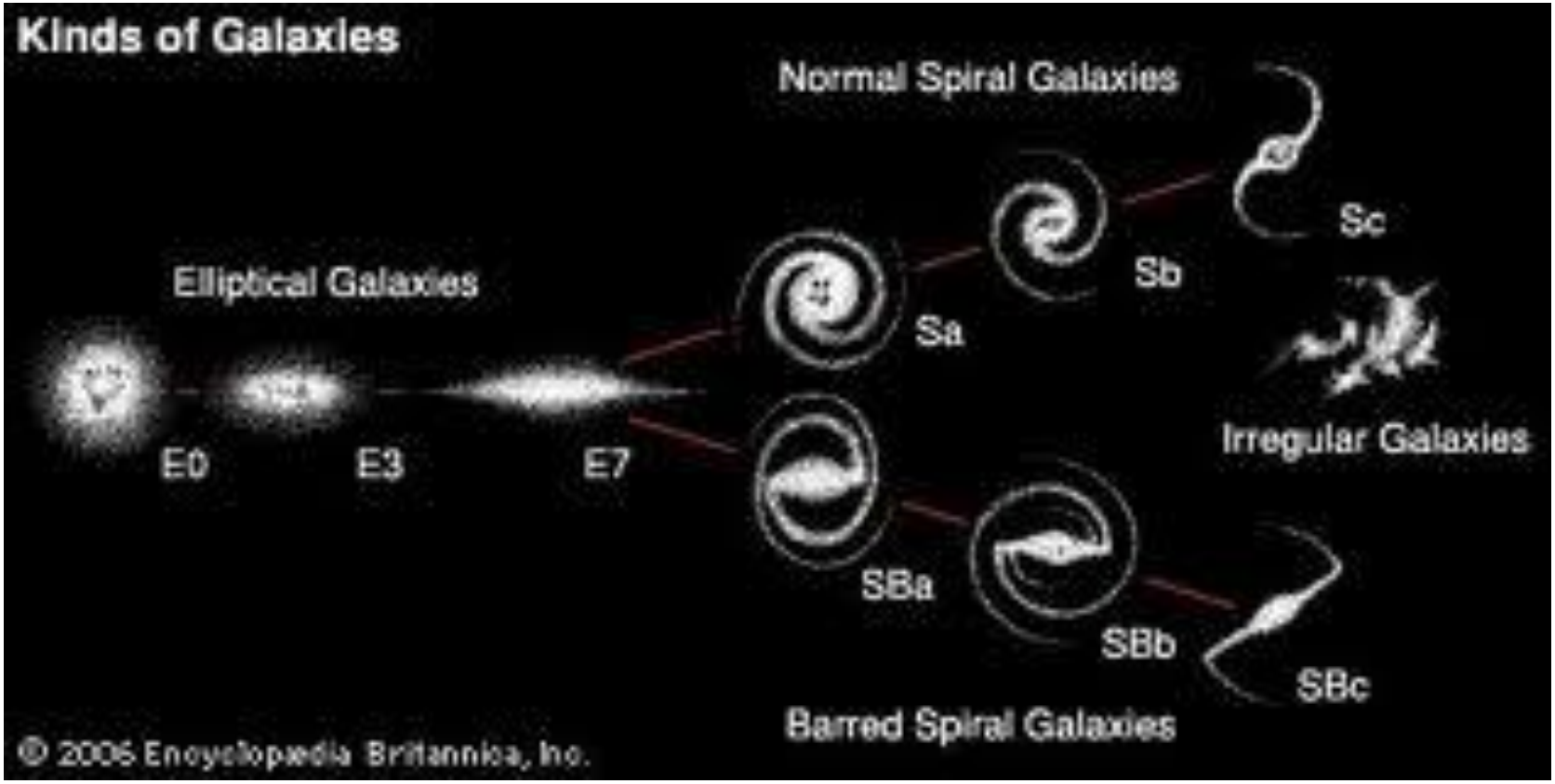
C

					irregular
Blue					
White					
Yellow					
Red					

Astronomical Classification

- Elliptical/Red/Yellow/White: do not contain young stars
- Irregular/Blue/White: newer, recent star formation

GALAXY CLASSIFICATION



Looking at these galaxies is like looking backward in time: we can see galaxies from near the beginning of the universe. From this picture we will roughly estimate the total number of galaxies in the universe and how much matter there is in the universe. We can use this information to find out the fate of the universe: whether it will expand forever, or collapse with a "Big Crunch" and perhaps then start up again with another Big Bang.