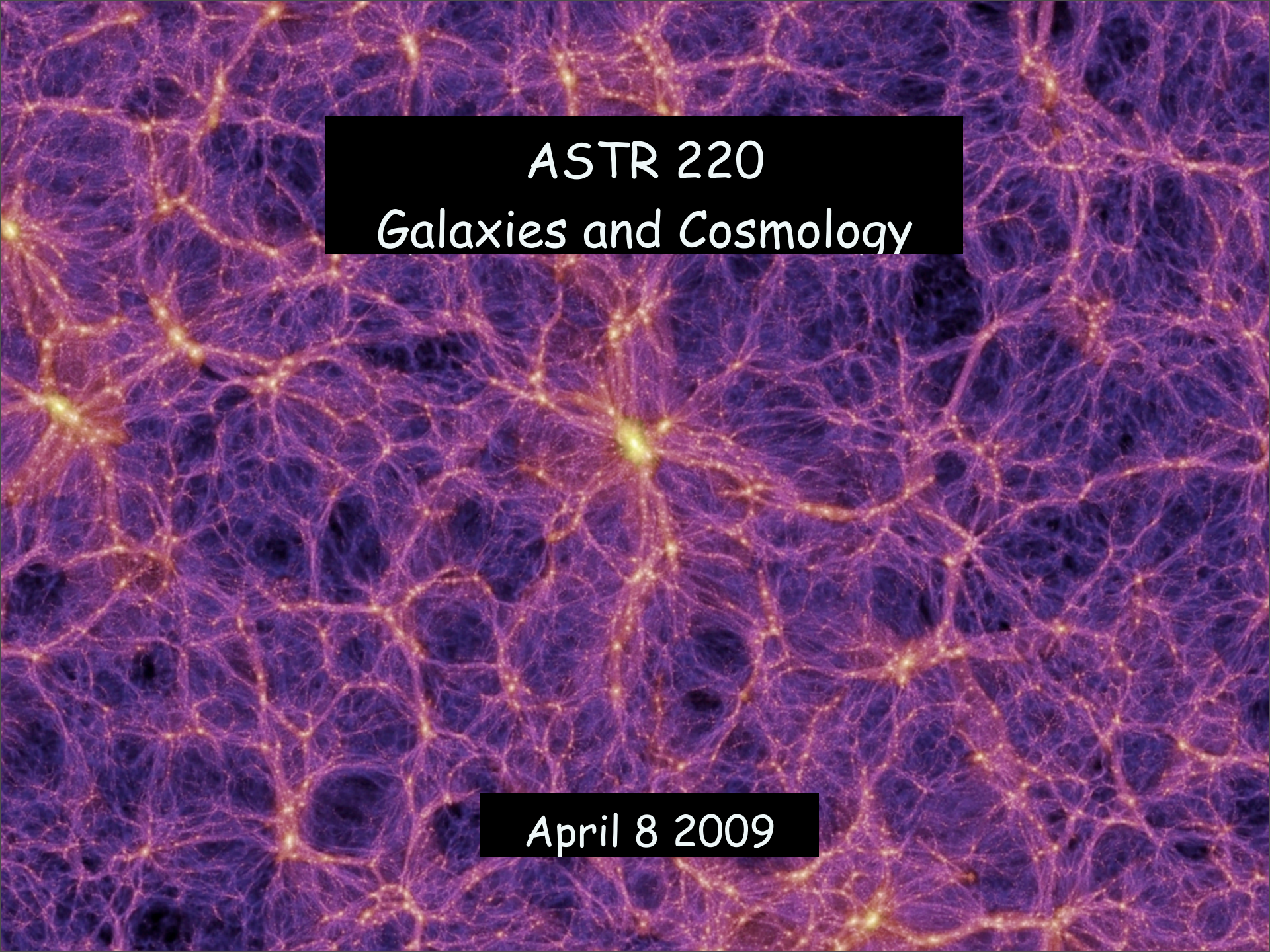
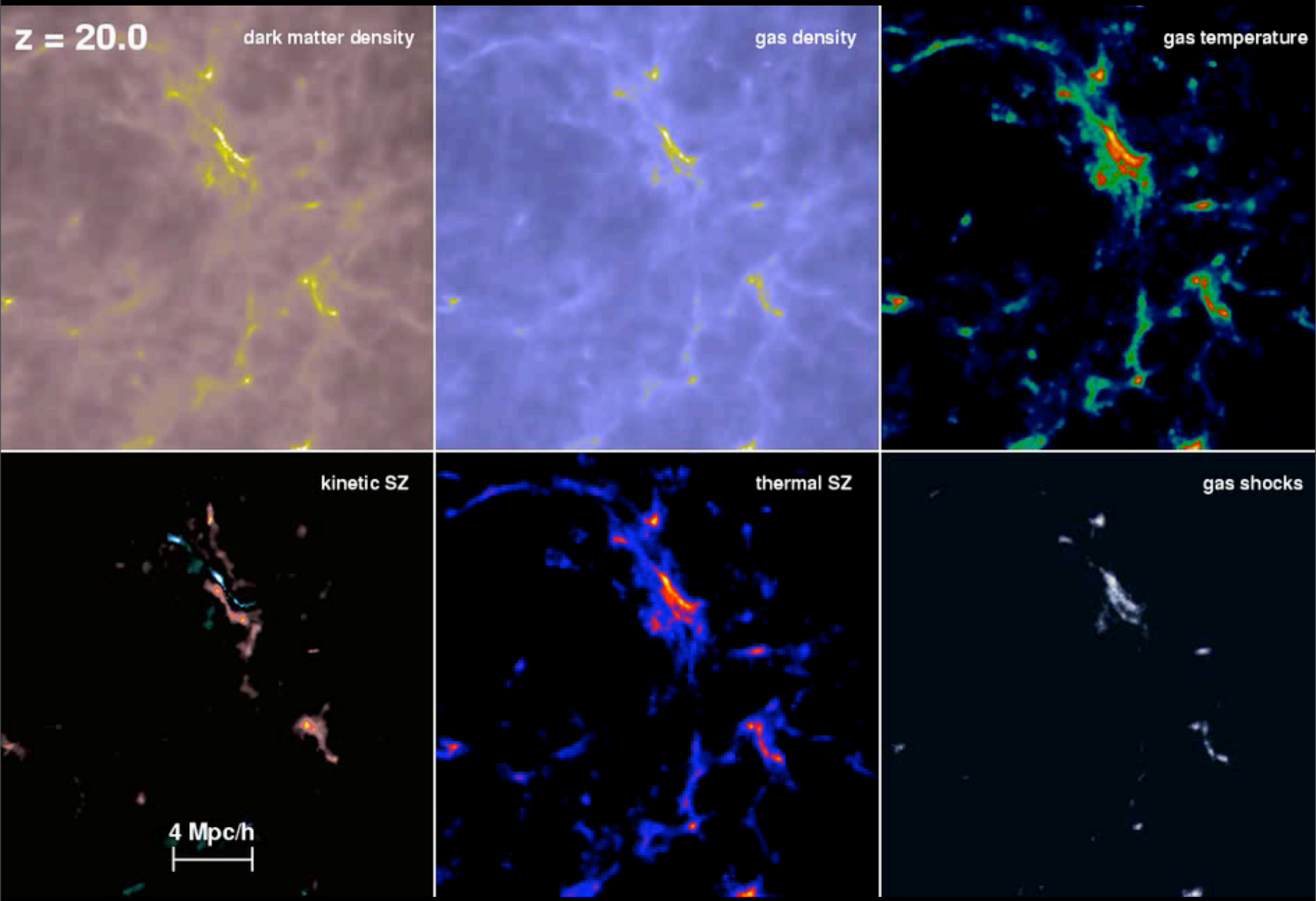
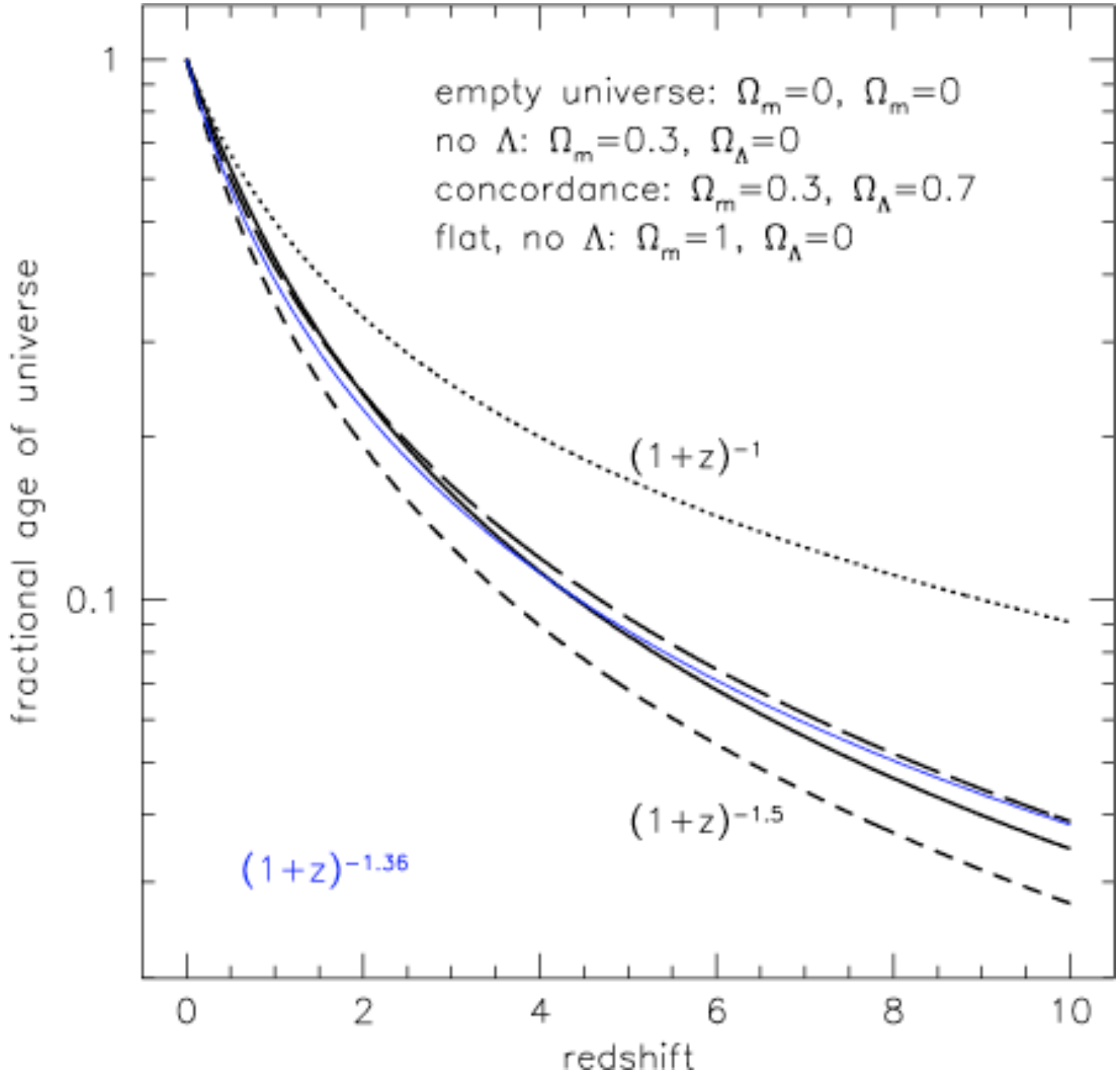
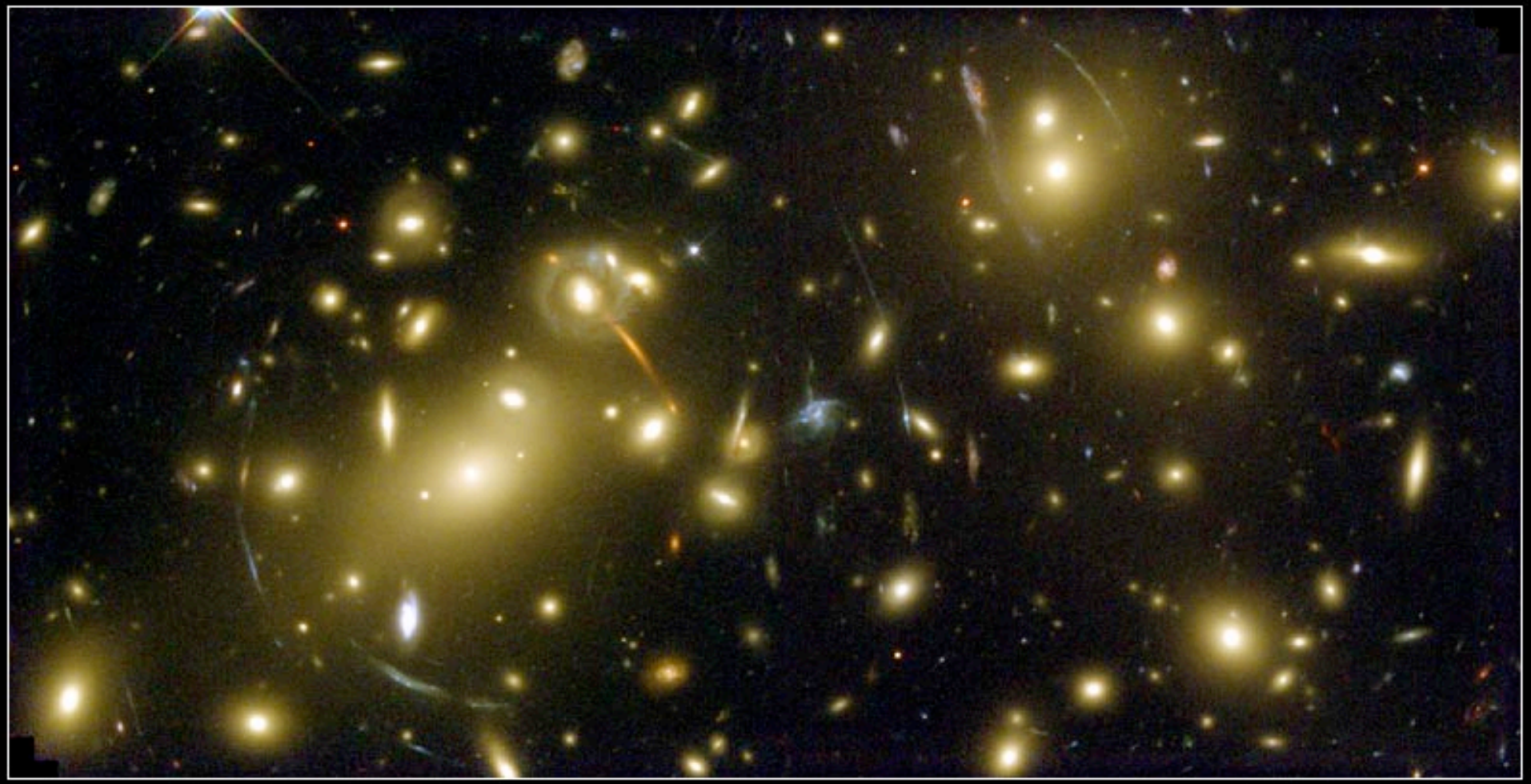


ASTR 220
Galaxies and Cosmology

April 8 2009


z = 20.0
dark matter density
gas density
gas temperature
kinetic SZ
thermal SZ
gas shocks
4 Mpc/h


empty universe: Ω_m=0, Ω_m=0
no Λ: Ω_m=0.3, Ω_Λ=0
concordance: Ω_m=0.3, Ω_Λ=0.7
flat, no Λ: Ω_m=1, Ω_Λ=0
$(1+z)^{-1}$
$(1+z)^{-1.5}$
$(1+z)^{-1.36}$
fractional age of universe
redshift
1
0.1
0
2
4
6
8
10

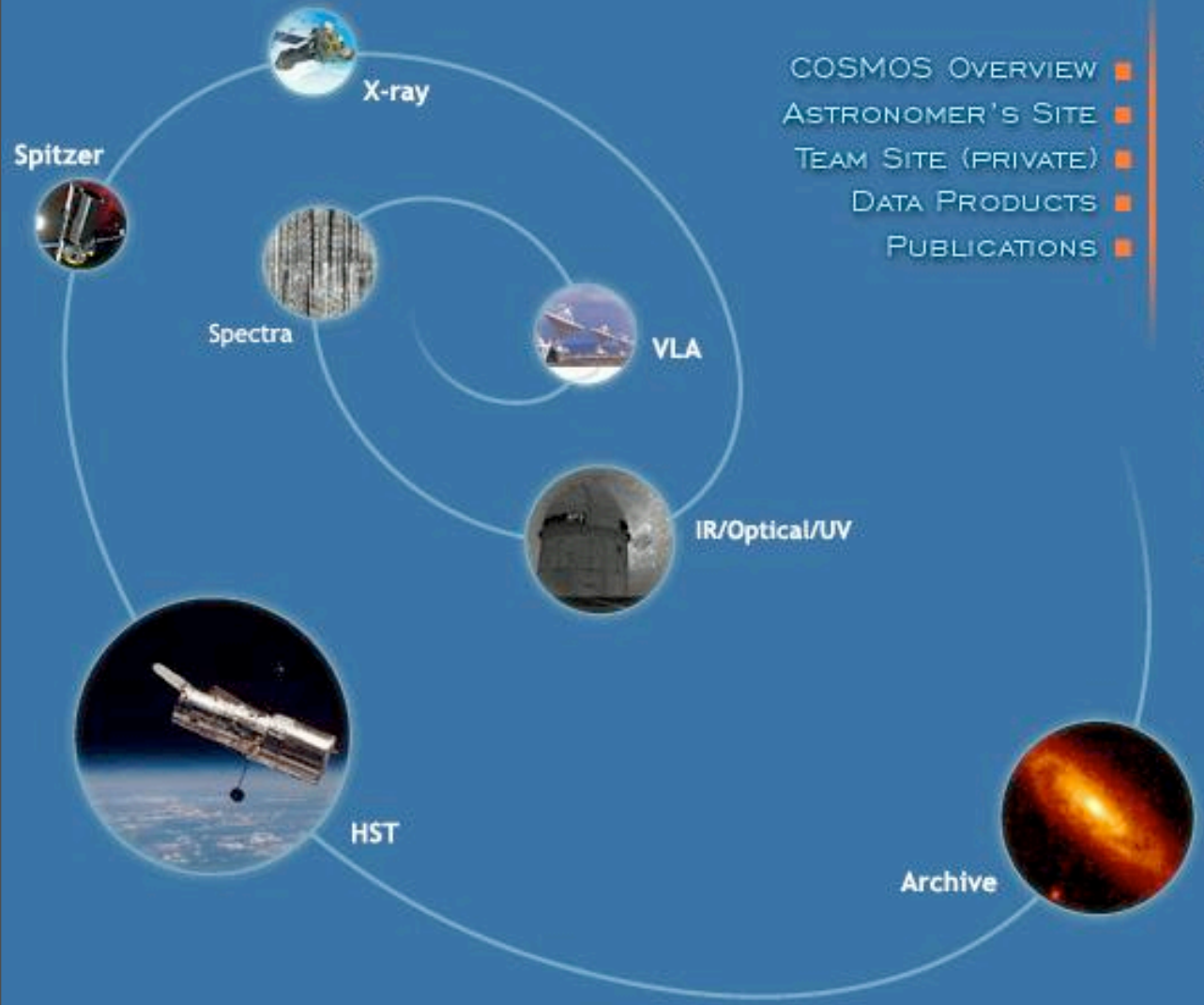


Galaxy Cluster Abell 2218 **HST • WFPC2**

NASA, A. Fruchter and the ERO Team (STScI) • STScI-PRC00-08

Cosmic Evolution Survey

C O S M O S

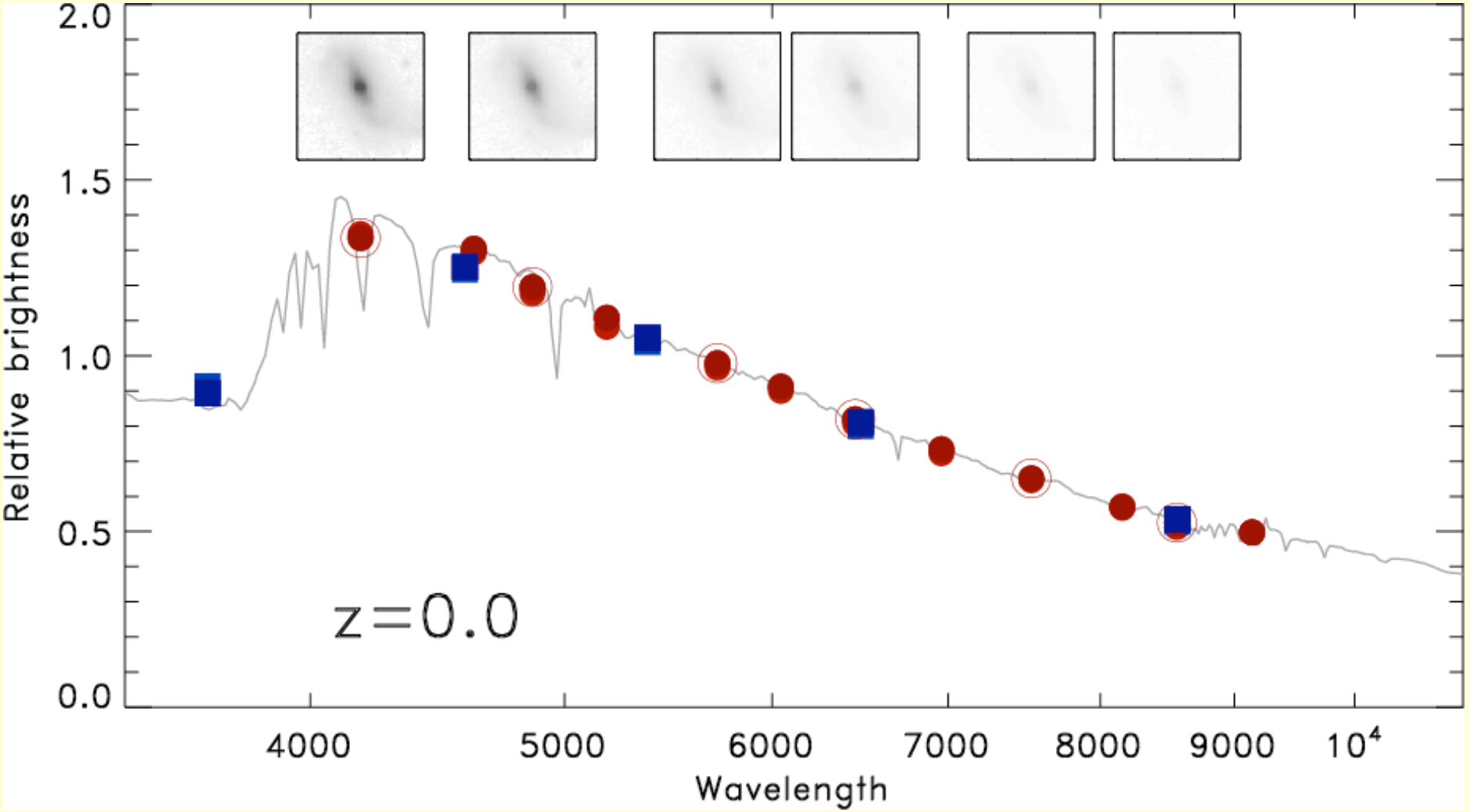


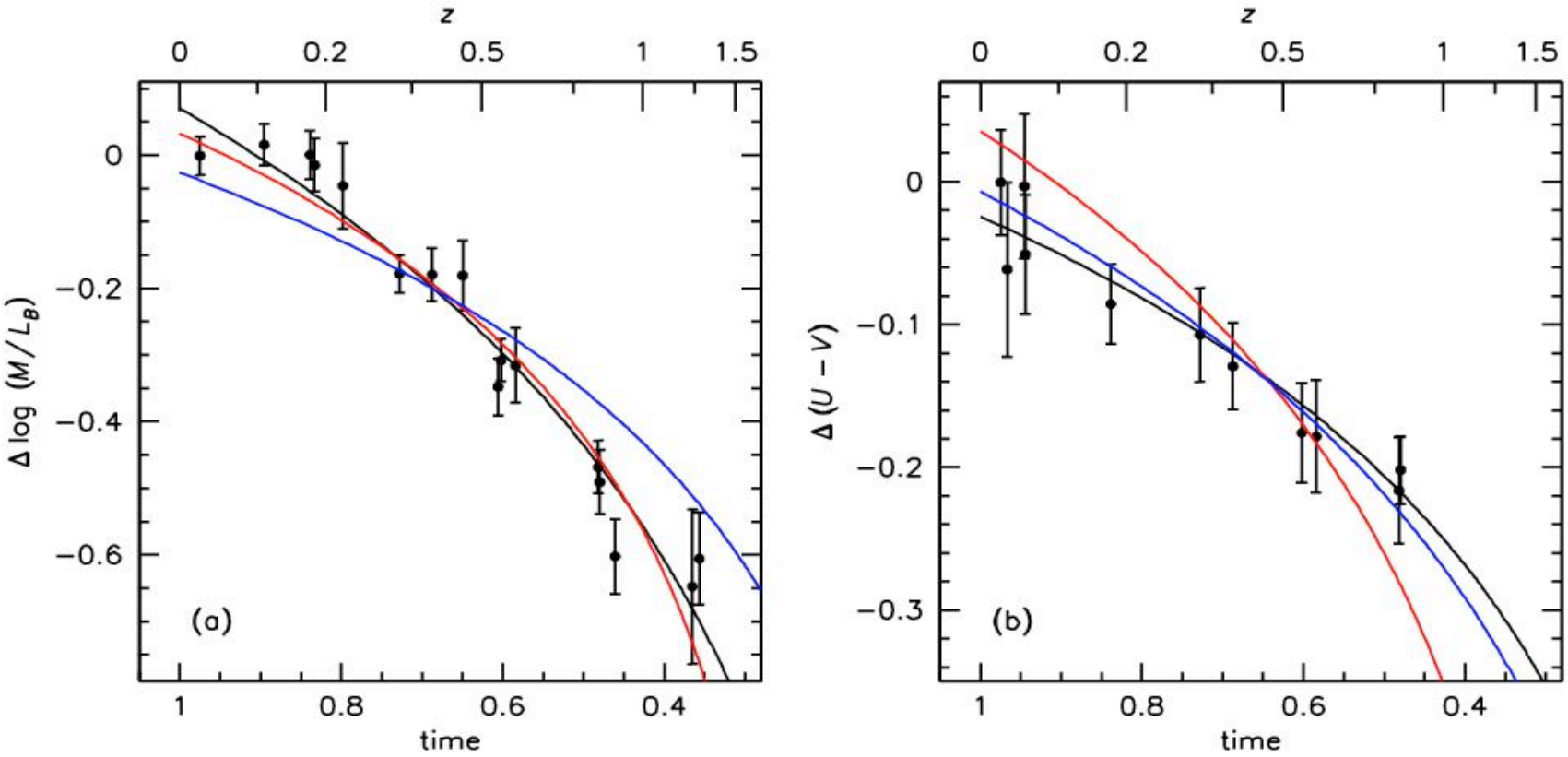
COSMOS Overview
Astronomer's Site
Team Site (private)
Data Products
Publications

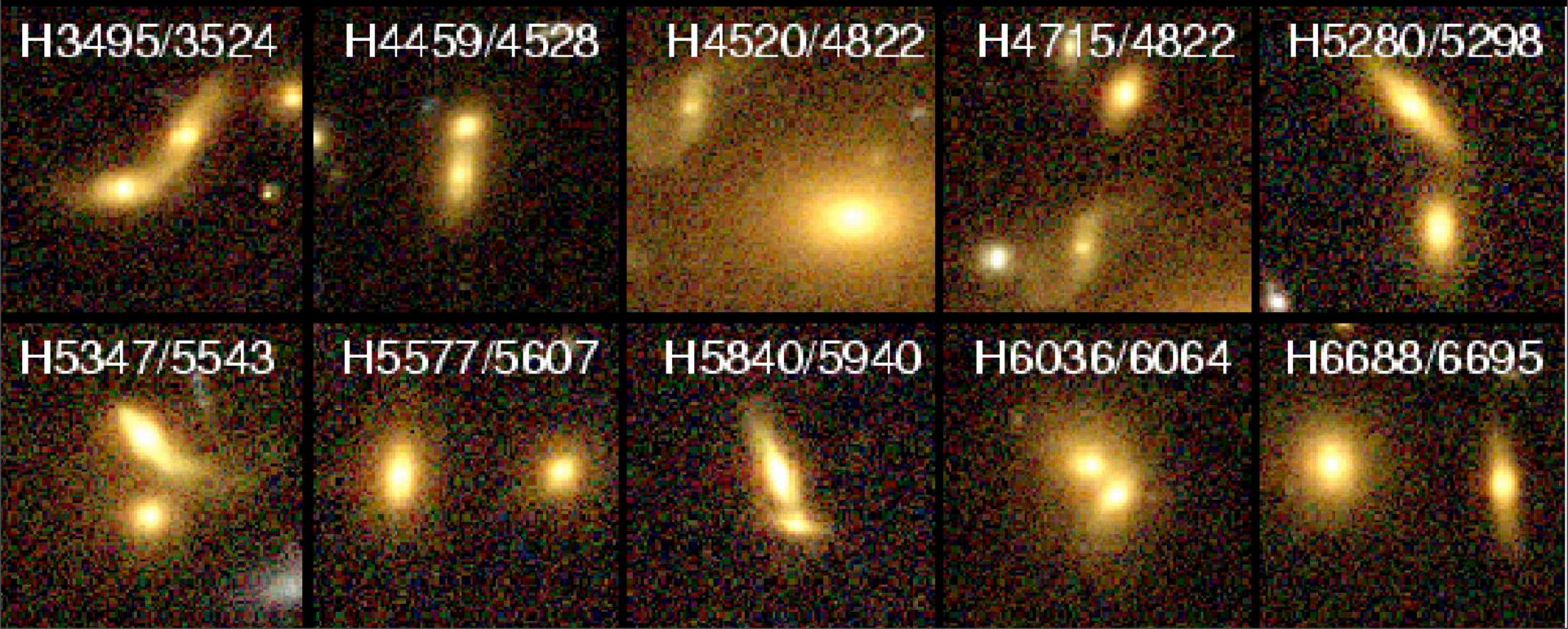
The Cosmological Evolution Survey (COSMOS) is an astronomical survey designed to probe the formation and evolution of galaxies as a function of cosmic time (redshift) and large scale structure environment. The survey covers a 2 square degree equatorial field with imaging by most of the major space-based telescopes (Hubble, Spitzer, GALEX, XMM, Chandra) and a number of large ground based telescopes (Subaru, VLA, ESO-VLT, UKIRT, NOAO, CFHT, and others). Over 2 million galaxies are detected, spanning 75% of the age of the universe. The COSMOS survey involves almost 100 scientists in a dozen countries.

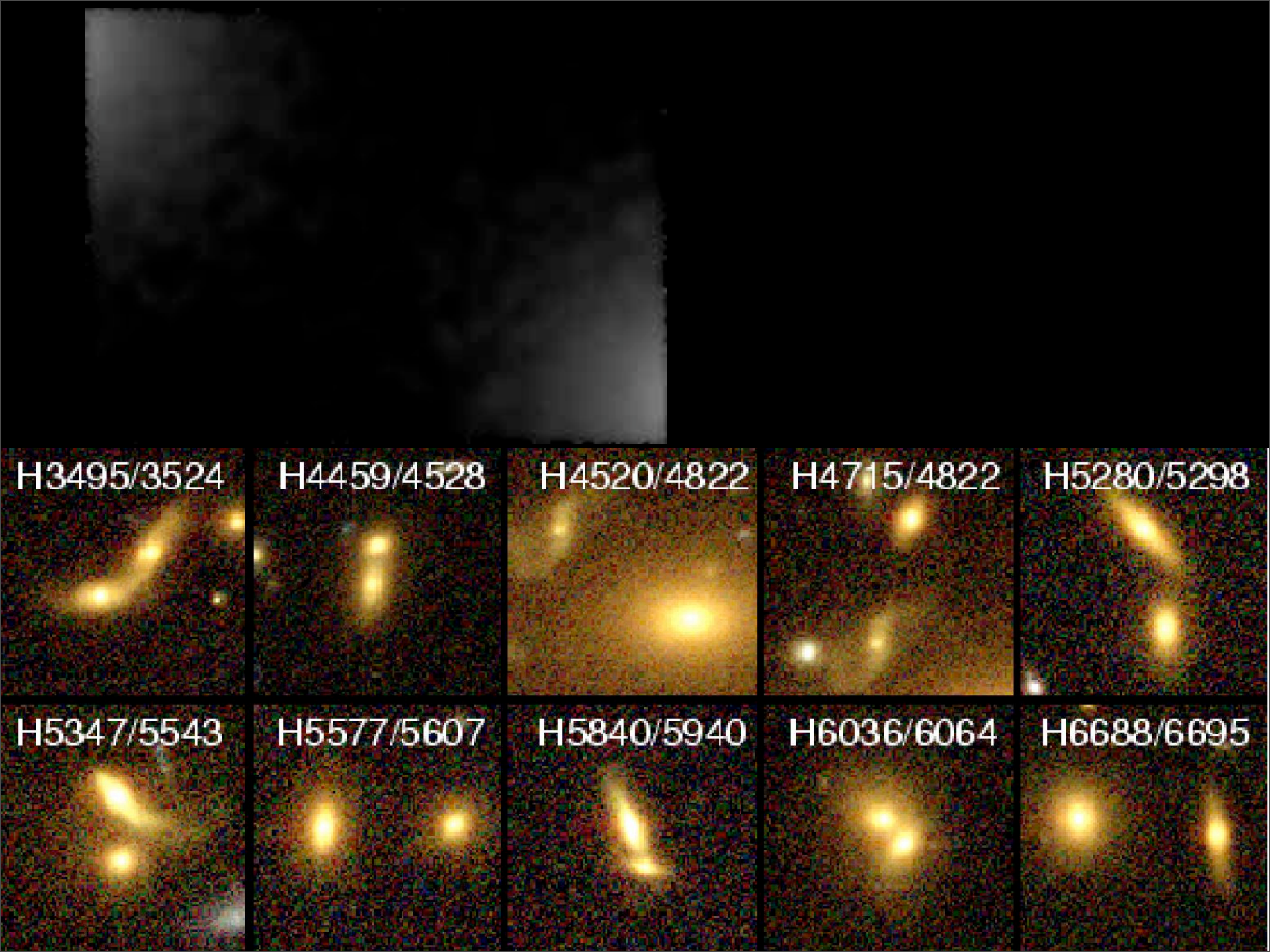
COSMOS in the News

Search

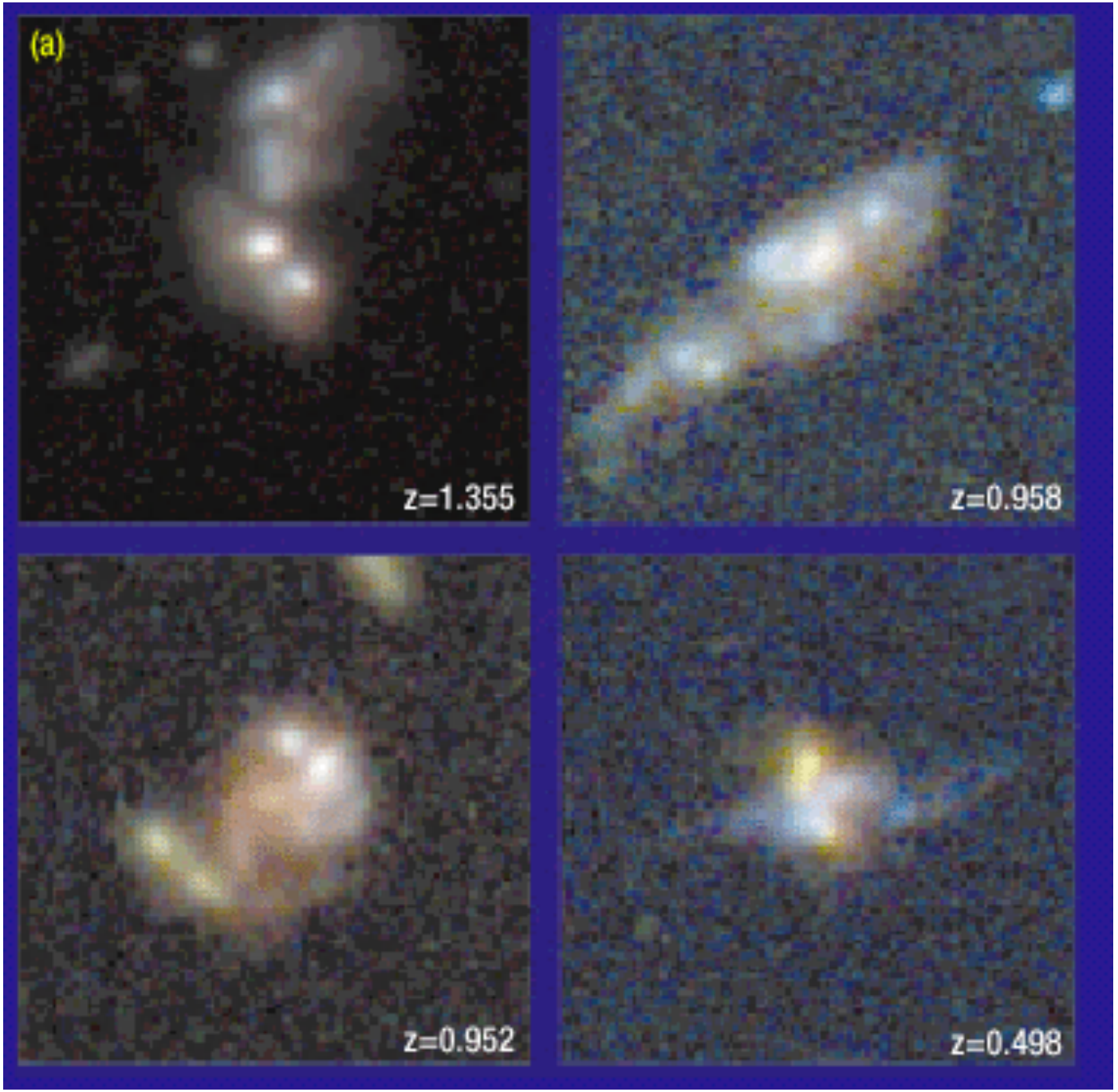

2.0
1.5
1.0
0.5
0.0
Relative brightness
z=0.0
4000
5000
6000
7000
8000
9000
10^4
Wavelength

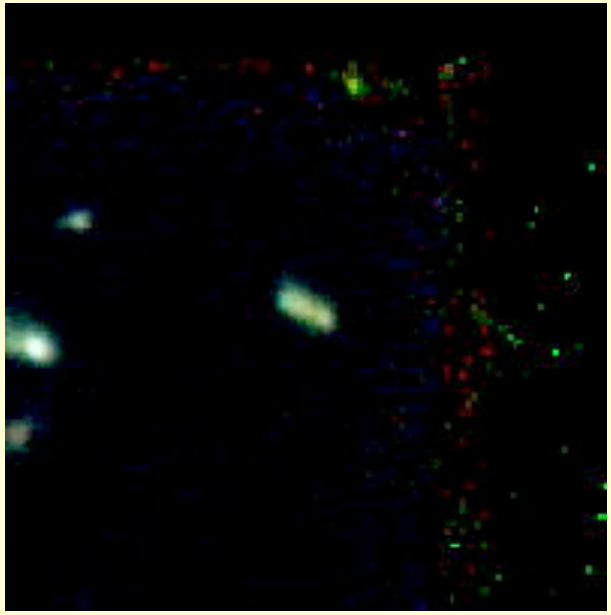
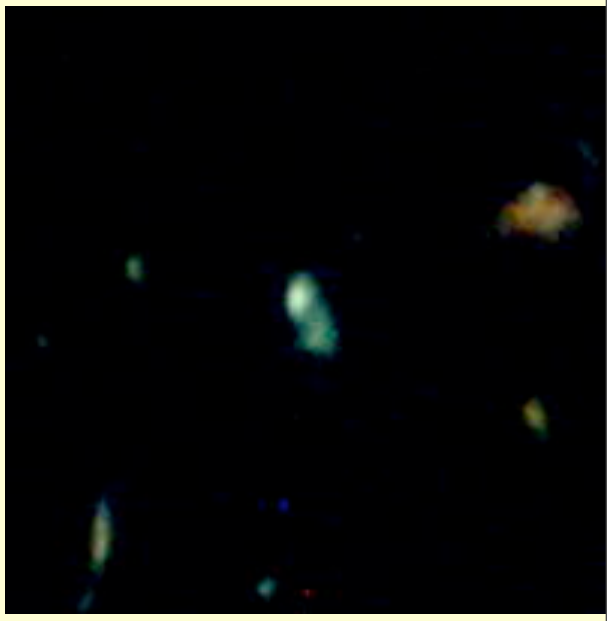

z
0
0.2
0.5
1
1.5
Δ log (M/L_B)
0
−0.2
−0.4
−0.6
(a)
1
0.8
0.6
0.4
time
z
0
0.2
0.5
1
1.5
Δ (U − V)
0
−0.1
−0.2
−0.3
(b)
1
0.8
0.6
0.4
time

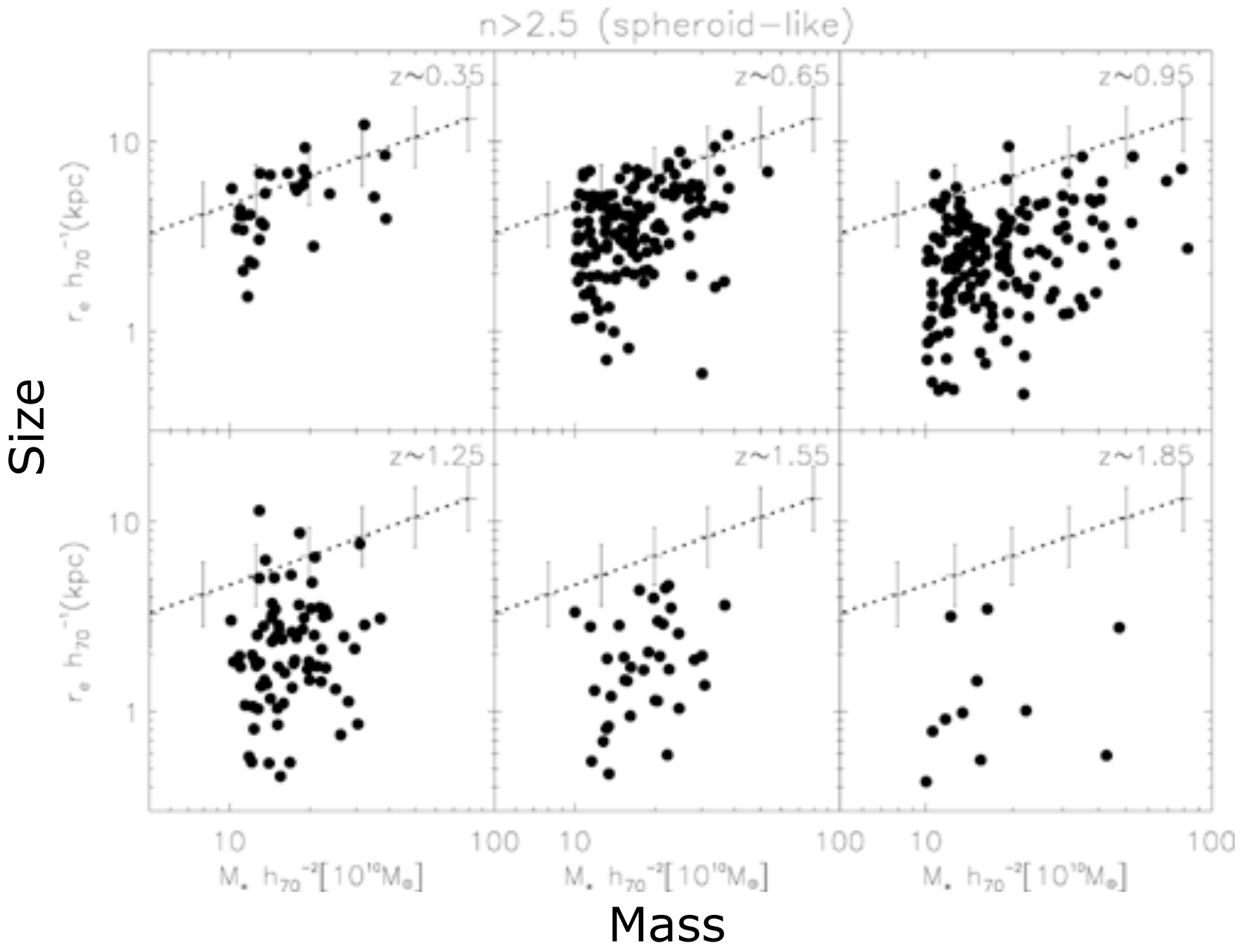

H3495/3524
H4459/4528
H4520/4822
H4715/4822
H5280/5298
H5347/5543
H5577/5607
H5840/5940
H6036/6064
H6688/6695

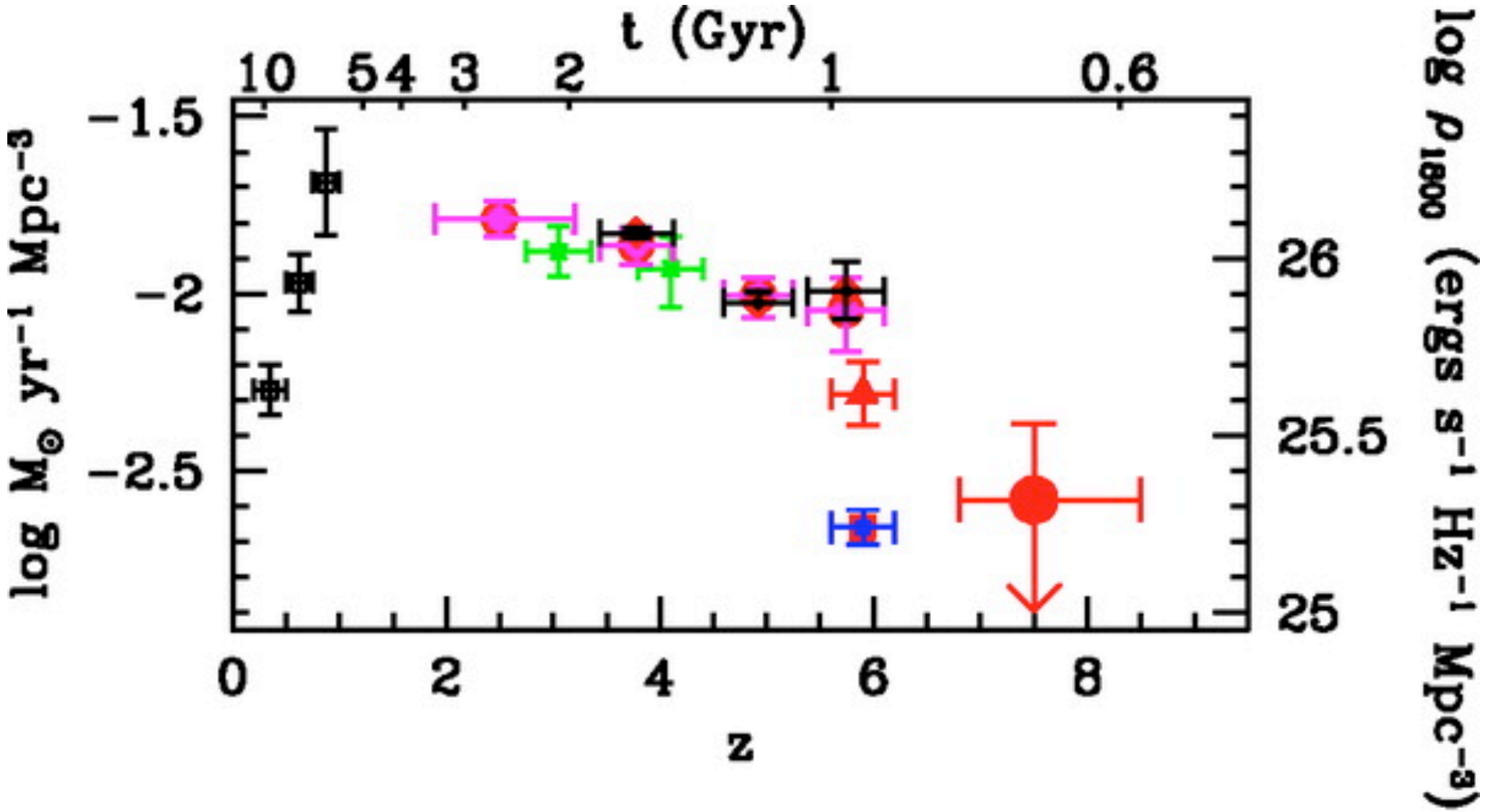

H3495/3524
H4459/4528
H4520/4822
H4715/4822
H5280/5298
H5347/5543
H5577/5607
H5840/5940
H6036/6064
H6688/6695

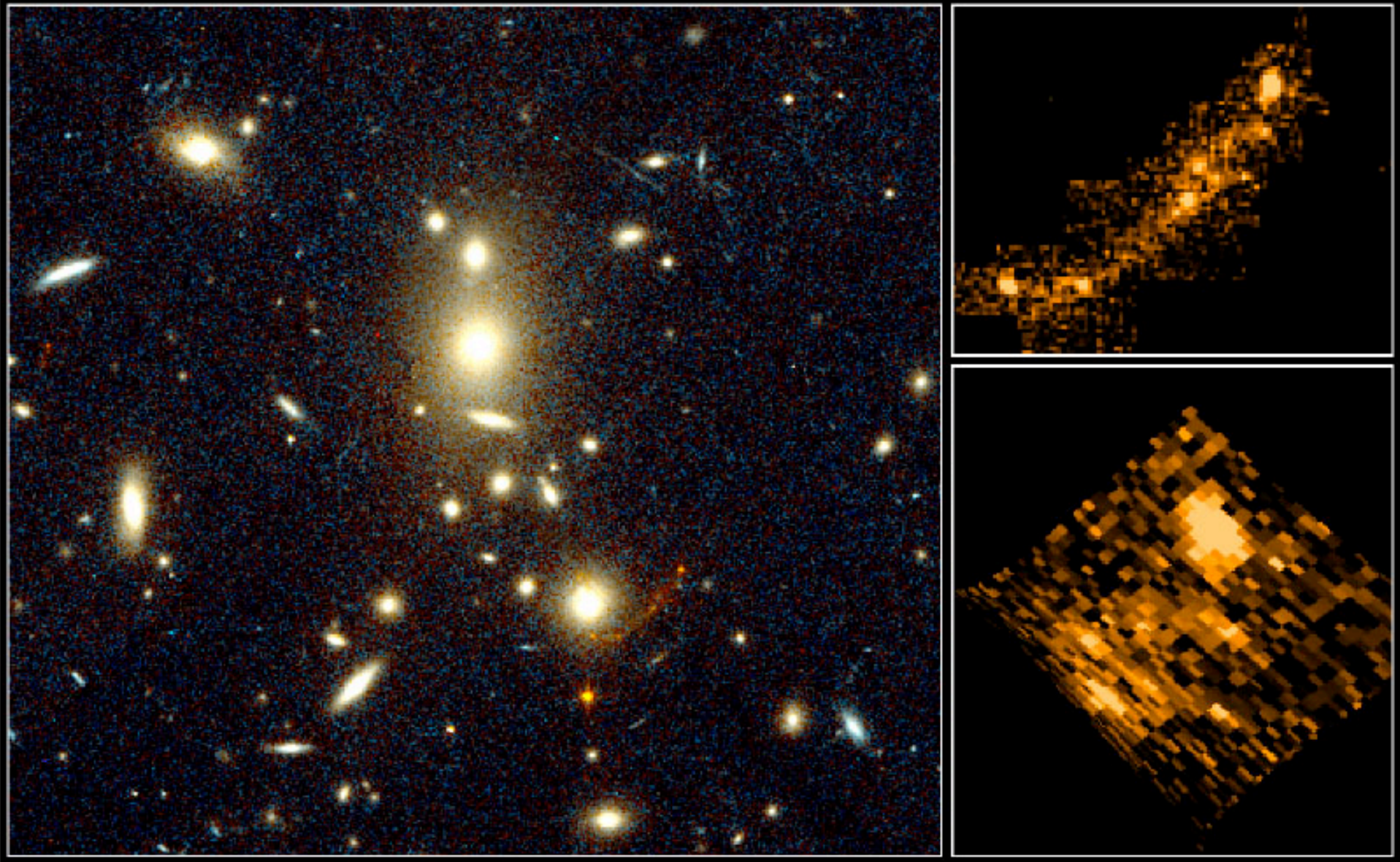

(a)
(b)
(c)
(d)


(a)
z=1.355
z=0.958
z=0.952
z=0.498


n>2.5 (spheroid−like)
z~0.35
z~0.65
z~0.95
z~1.25
z~1.55
z~1.85
10
1
100
$r_e\ h_{70}^{-1}$(kpc)
$M_*\ h_{70}^{-2}[10^{10}M_\odot]$
Size
Mass


t (Gyr)
10
5
4
3
2
1
0.6
−1.5
−2
−2.5
log M⊙ yr⁻¹ Mpc⁻³
0
2
4
6
8
z
26
25.5
25
log ρ1800 (ergs s⁻¹ Hz⁻¹ Mpc⁻³)

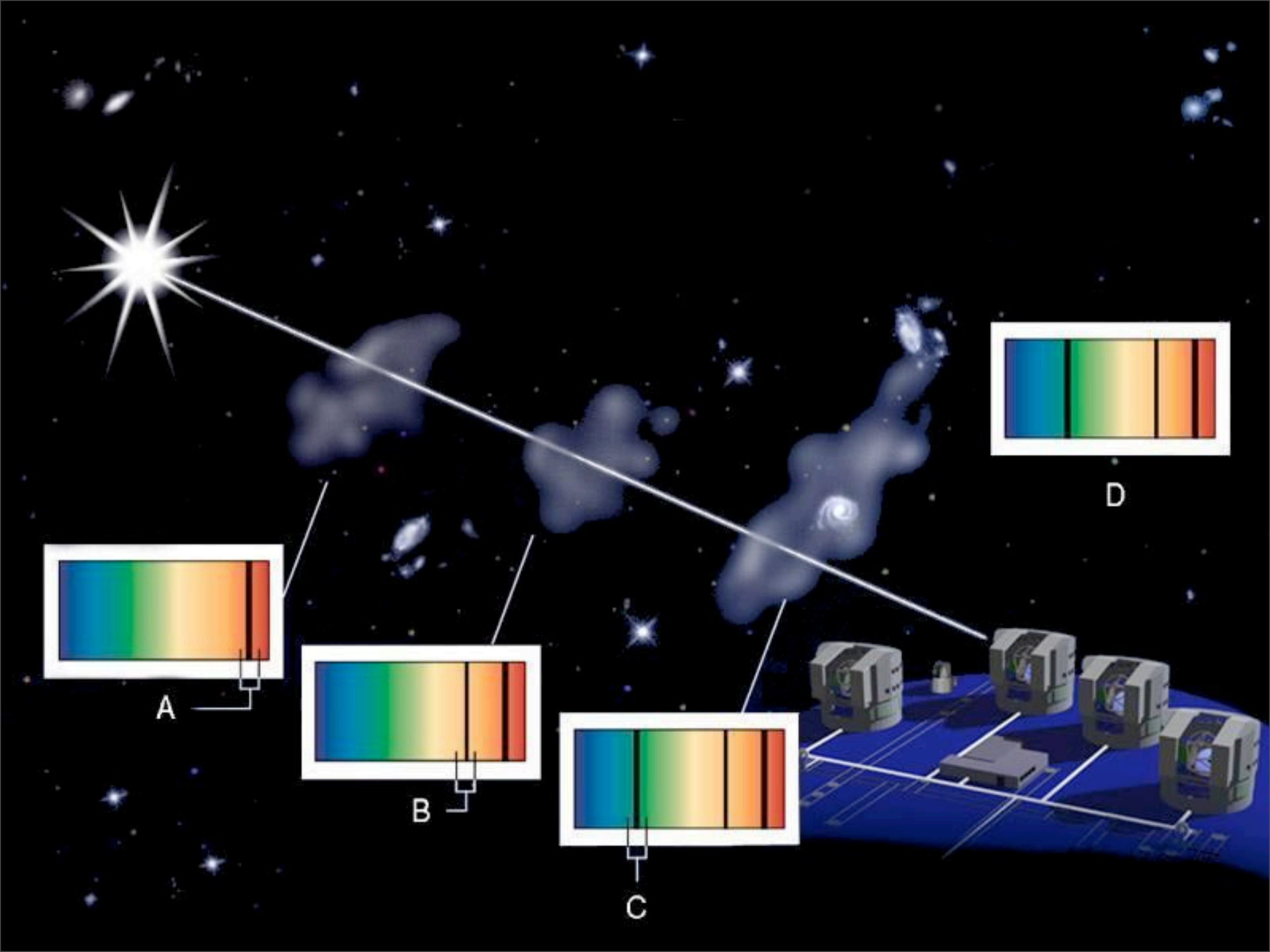


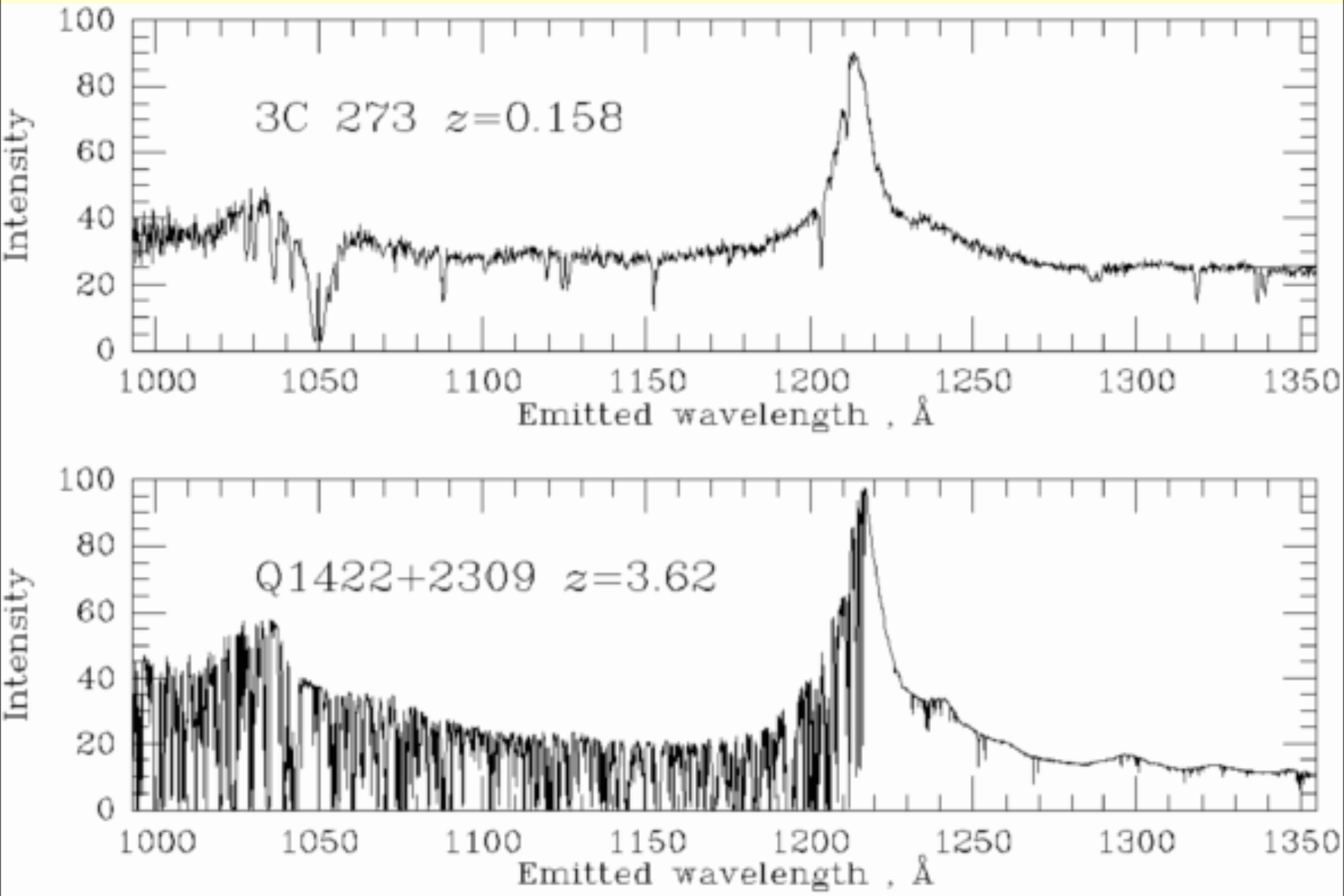
Gravitationally Lensed Image of Highest Redshift Galaxy

HST
WFPC2

PRC97-25 • ST ScI OPO • July 30, 1997

M. Franx (Kapteyn Astronomical Institute), G. Illingworth (Lick Observatory) and NASA


A
B
C
D


3C 273 z=0.158
Intensity
Emitted wavelength , Å
Q1422+2309 z=3.62
Intensity
Emitted wavelength , Å