



THE GHOST LIGHT OF ABELL 2744

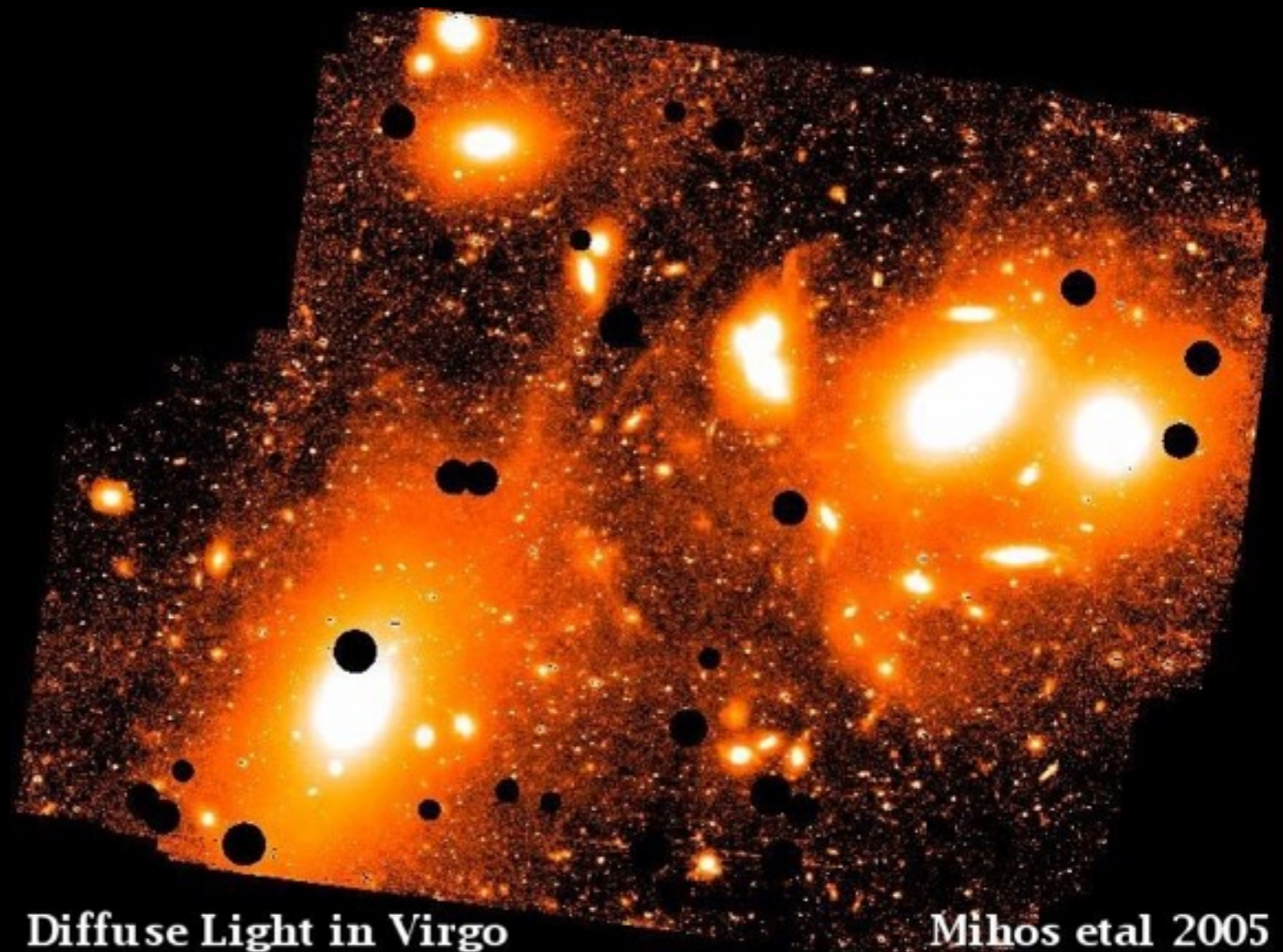
Mireia Montes



THE GHOST LIGHT

- The diffuse light from free floating stars in the intergalactic medium of a cluster.
- They are gravitationally bound to the cluster but not to any particular galaxy.

Intracluster Light
(ICL)



Diffuse Light in Virgo

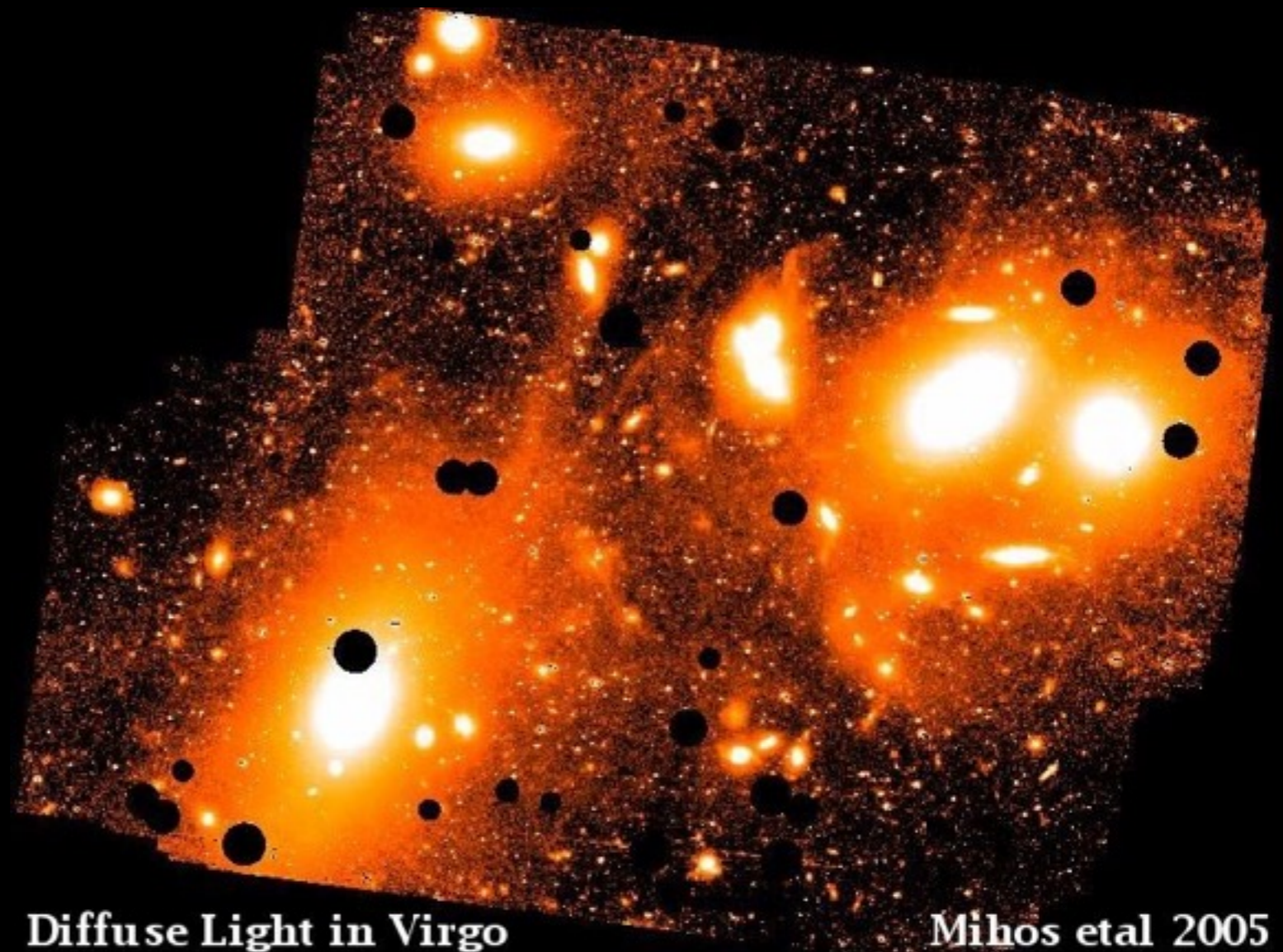
Mihos et al 2005

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Intracluster Light
(ICL)

or
stupid annoying
light



Diffuse Light in Virgo

Mihos et al 2005

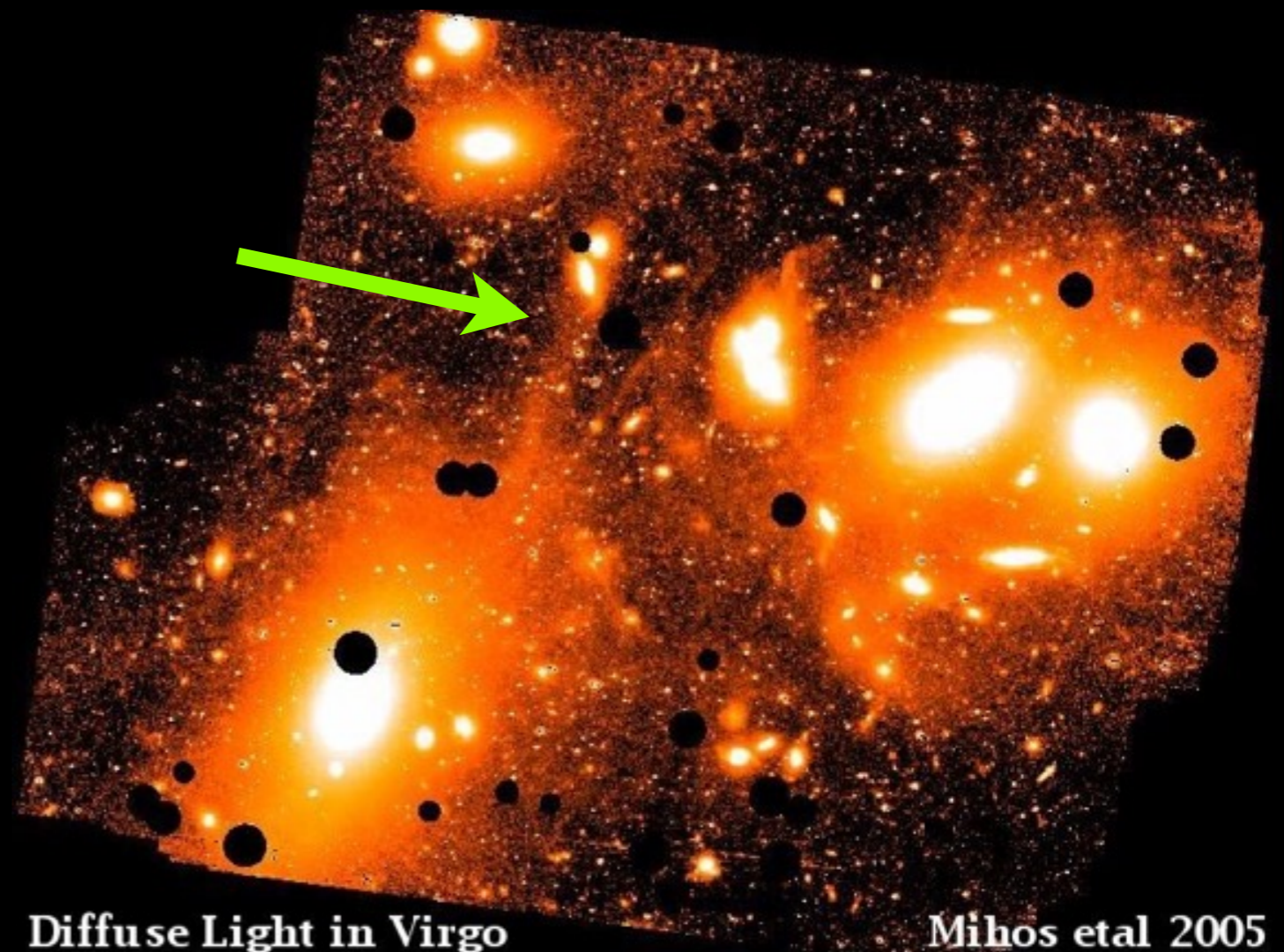
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ICL is a **relevant remnant** of the merging events that formed the cluster

THE GHOST LIGHT: WHAT DOES IT TELL US?

The story of assembly of the galaxy cluster

- How violent it was? → Mass in stars
- When does it happen? → Age of the stars
- Who are the progenitors? → Metallicity of the stars

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Very challenging to observe!!

Hubble Frontier Fields: Abell 2744

Credit: NASA, ESA, Z. Levay, HFF team

- HFF are the **deepest** observations of galaxy clusters with HST ($0.3 < z < 0.6$)
- **Multiwavelength** observations (F435W, F606W, F814W, F105W, F125W, F140W, F160W)
- First HFF cluster : Abell 2744



Hubble Frontier Fields: Abell 2744

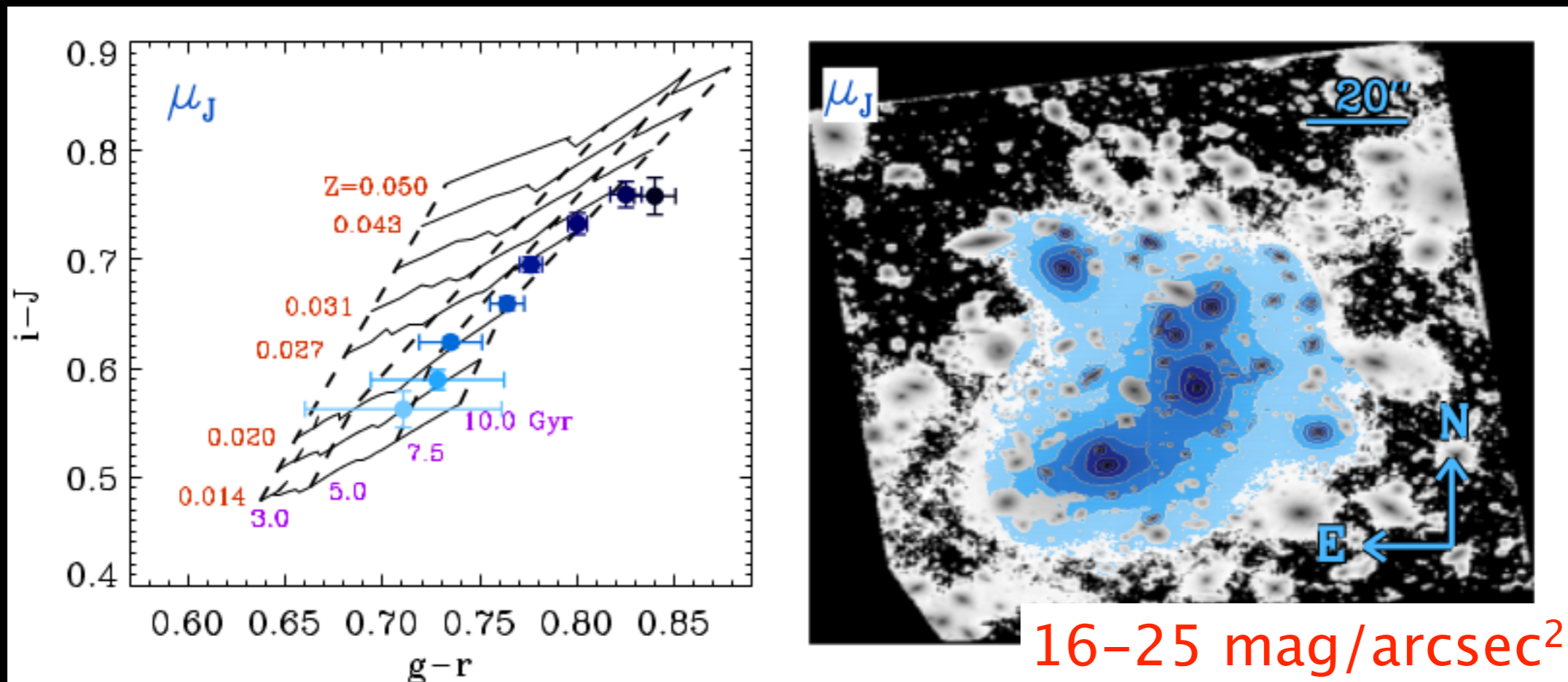
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**We can study the ICL
~4 mag above
the SB limits**



The ICL of Abell 2744



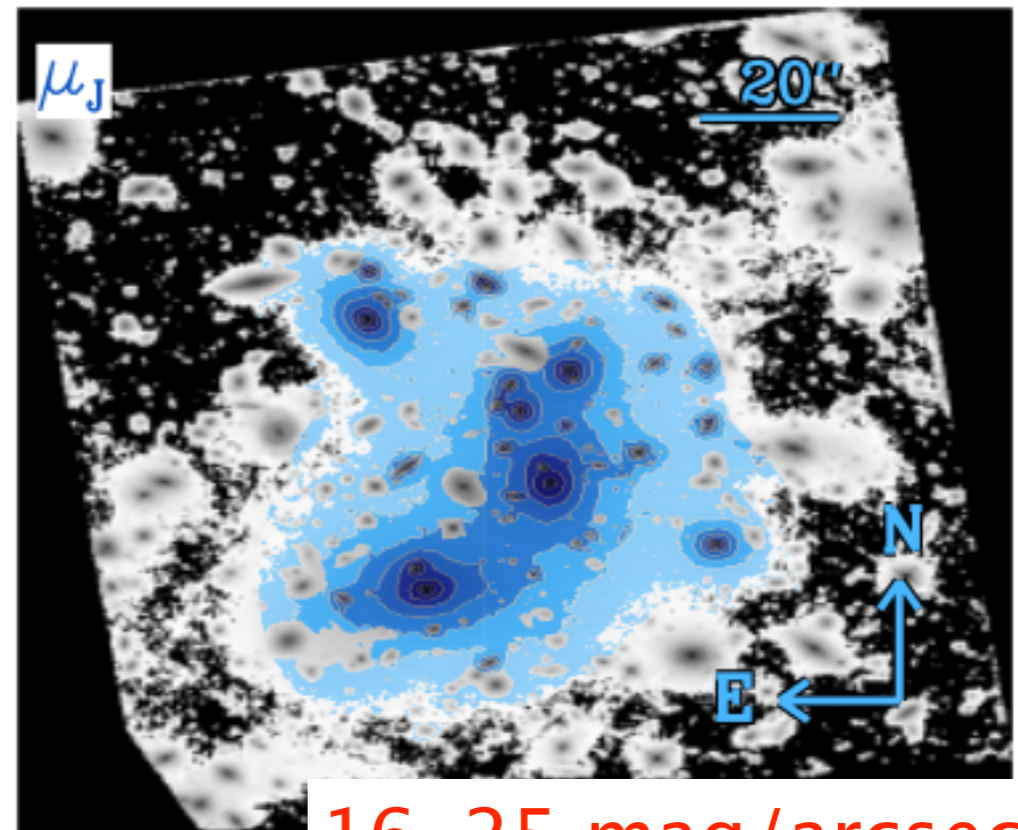
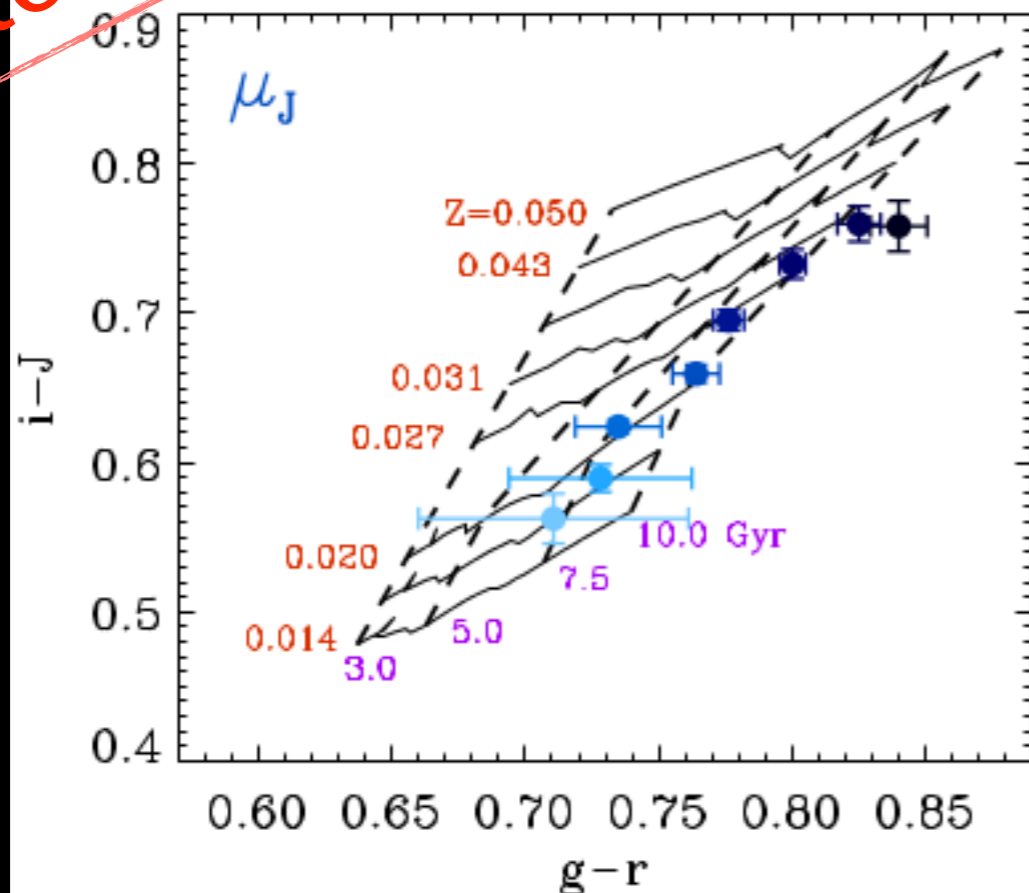
MONTES & TRUJILLO 2014

Inner \Rightarrow Outer

Also for ρ and radial distance

The ICL of Abell 2744

Out to 120 kpc



MONTES & TRUJILLO 2014

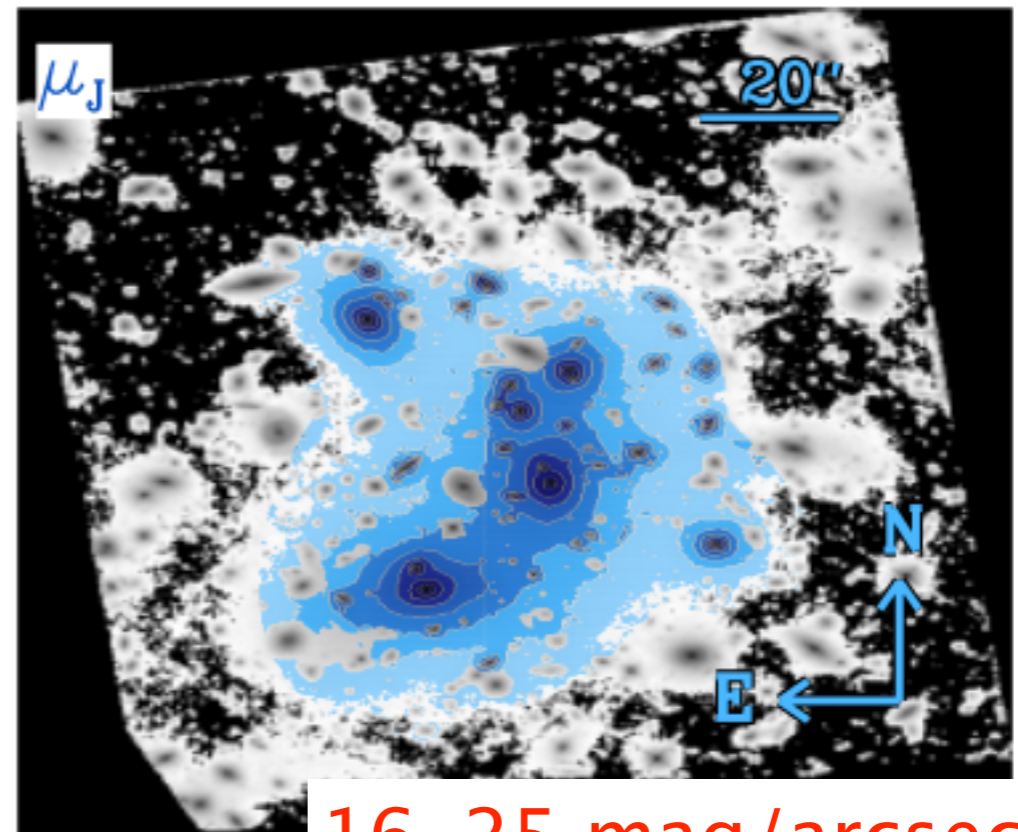
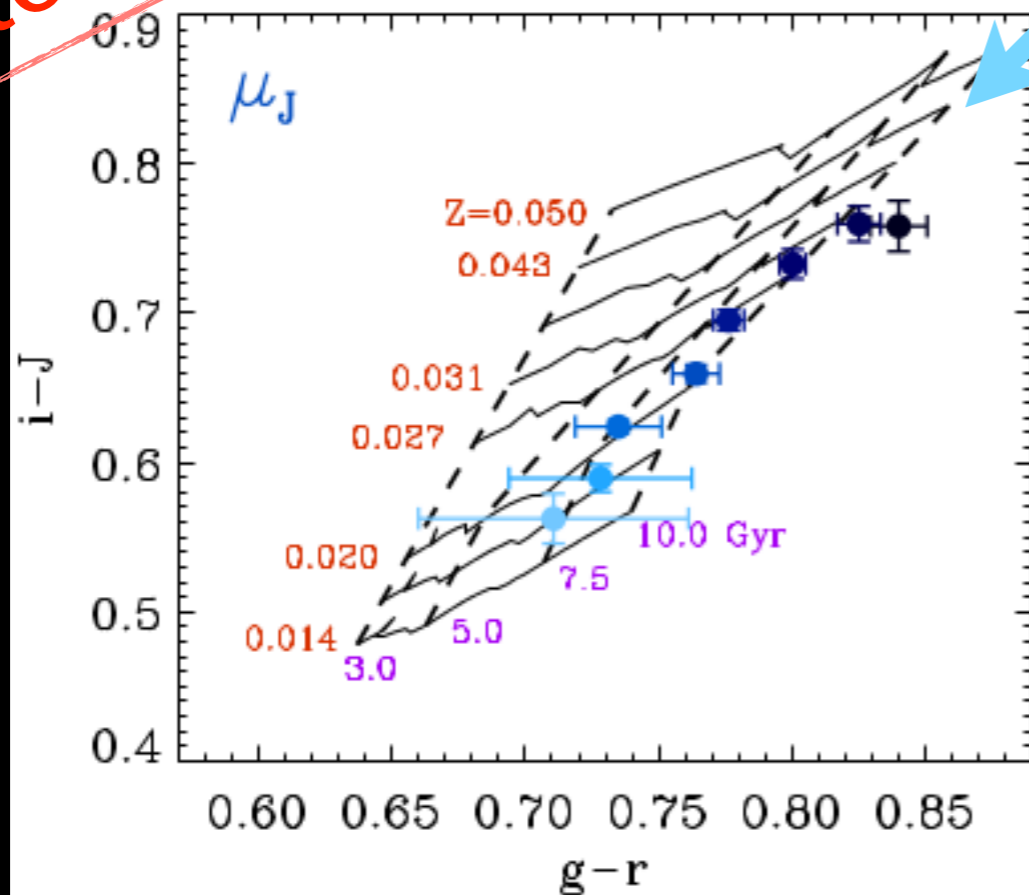
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Out to 120 kpc

Using $op+IR$ to break age-metallicity degeneracy



16-25 mag/arcsec²

MONTES & TRUJILLO 2014

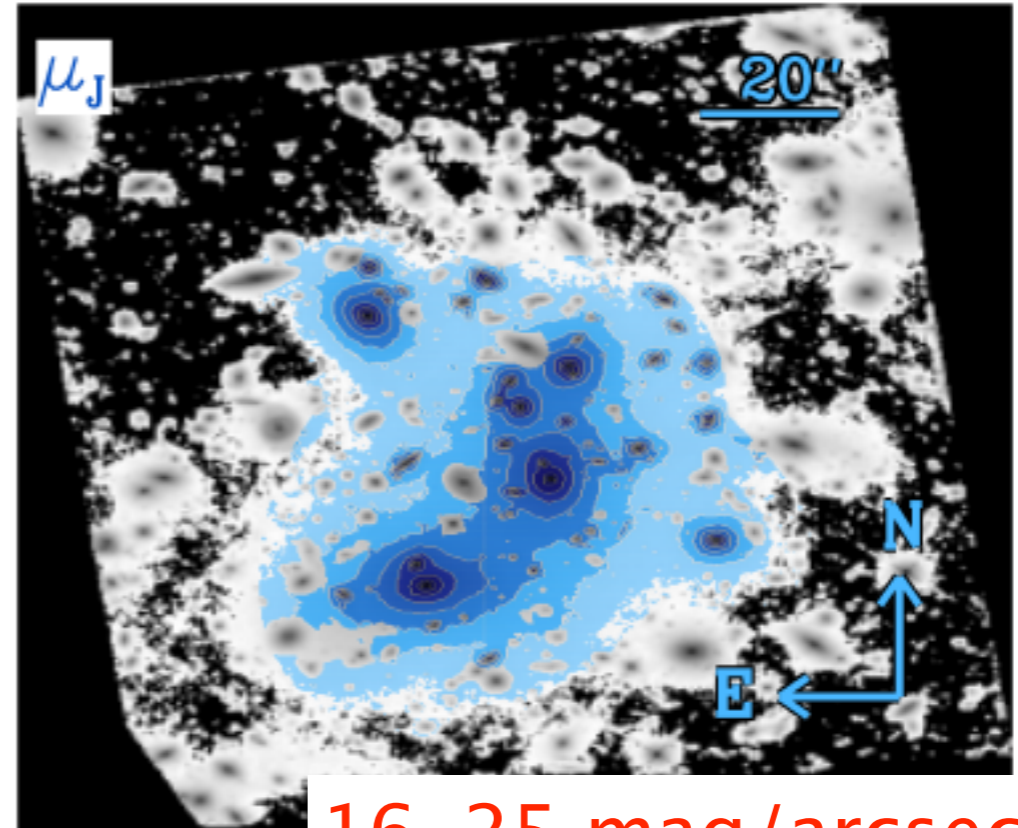
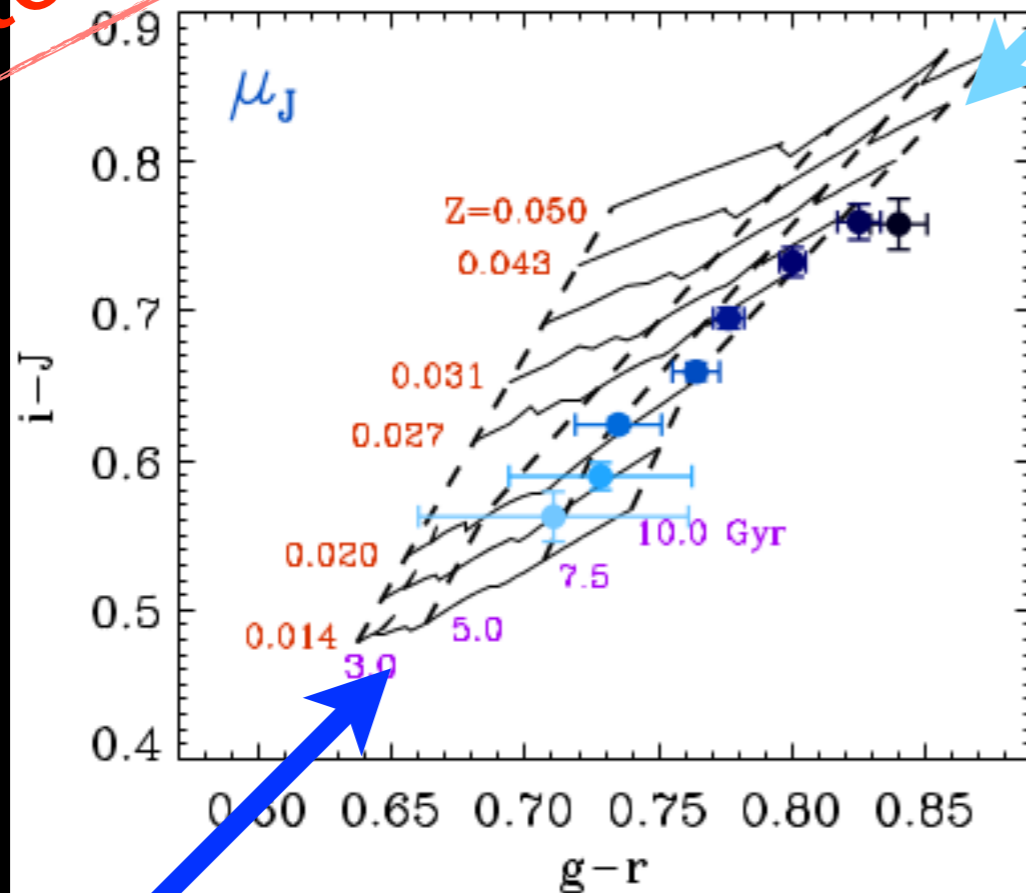
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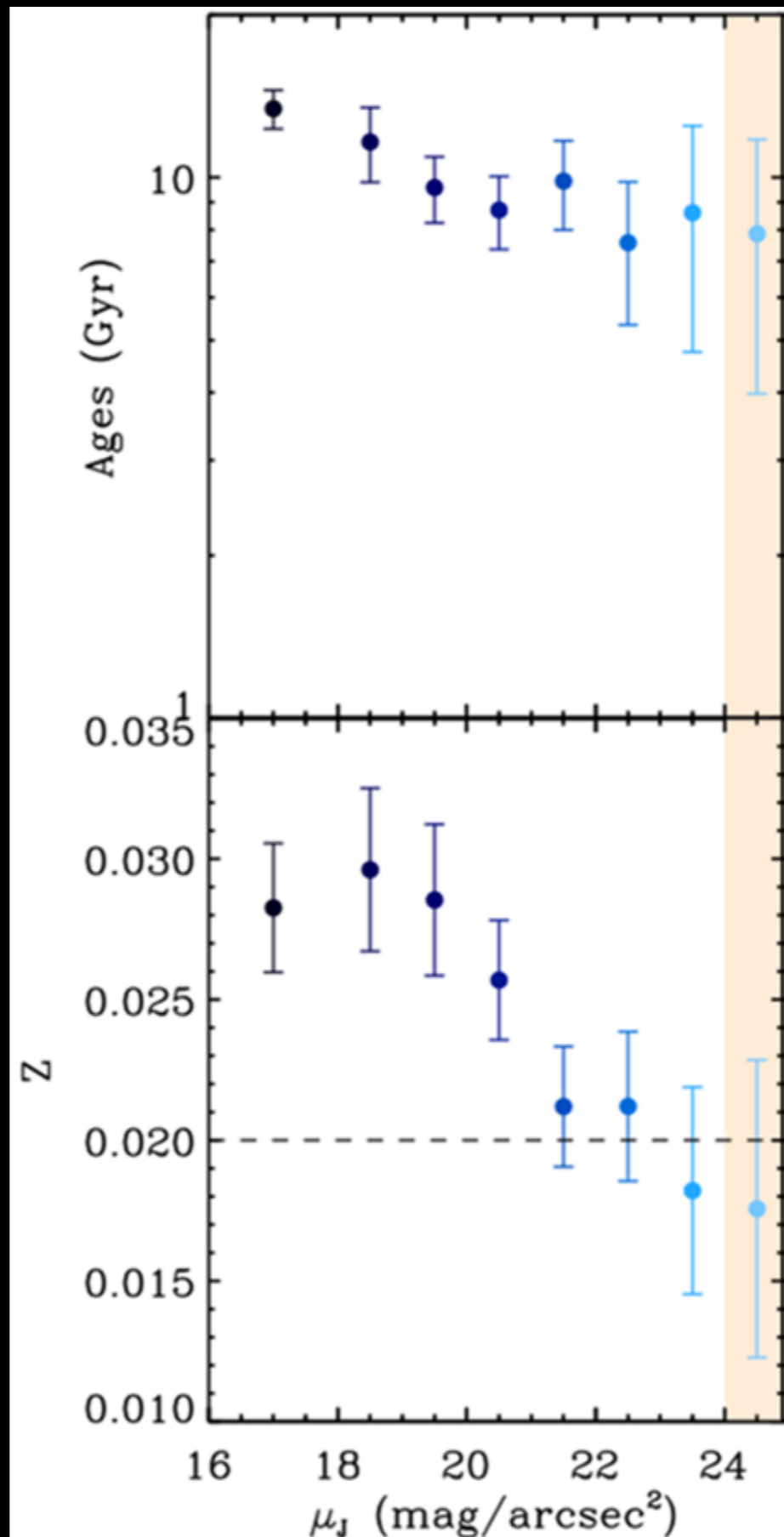
Bruzual & Charlot 2003

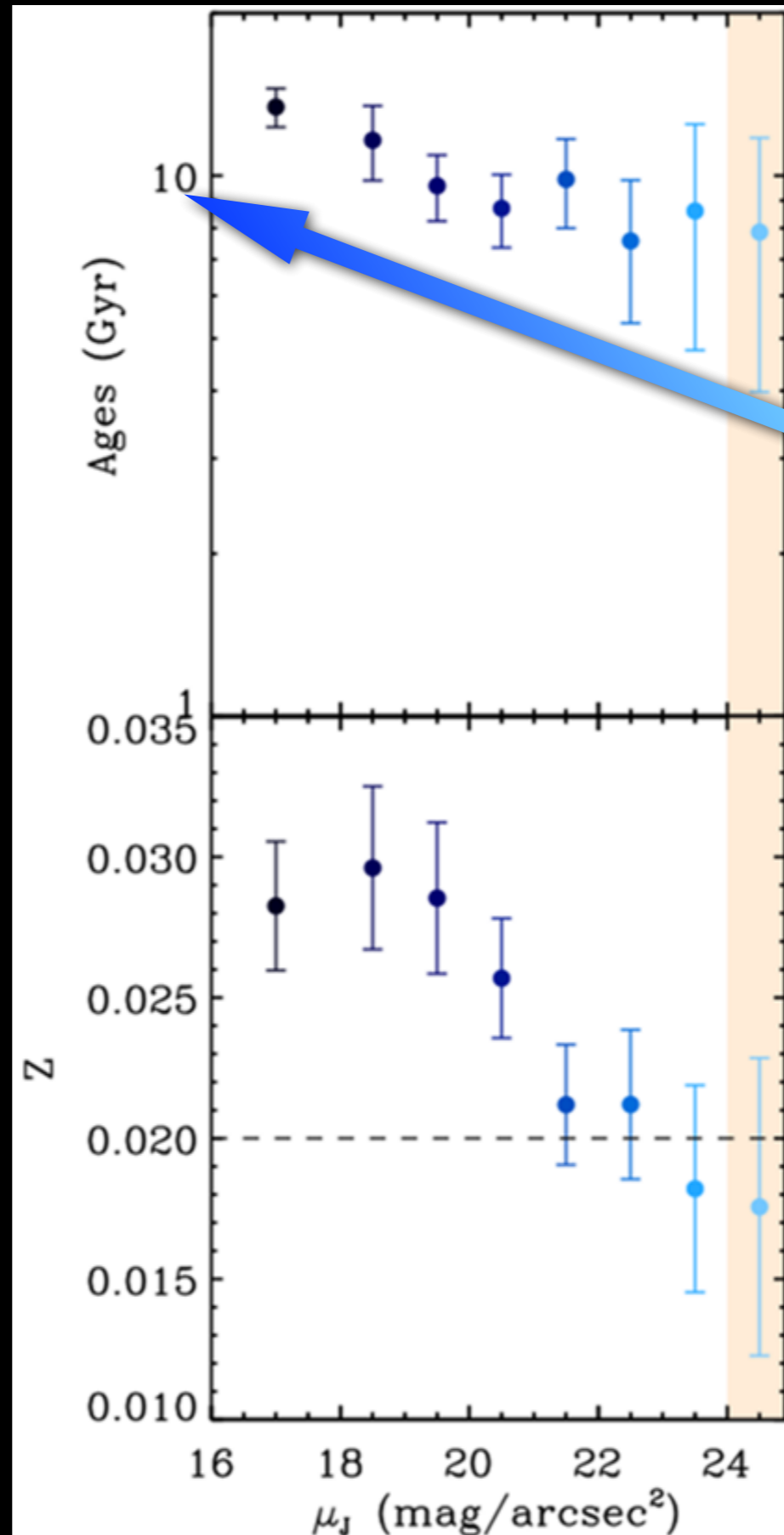
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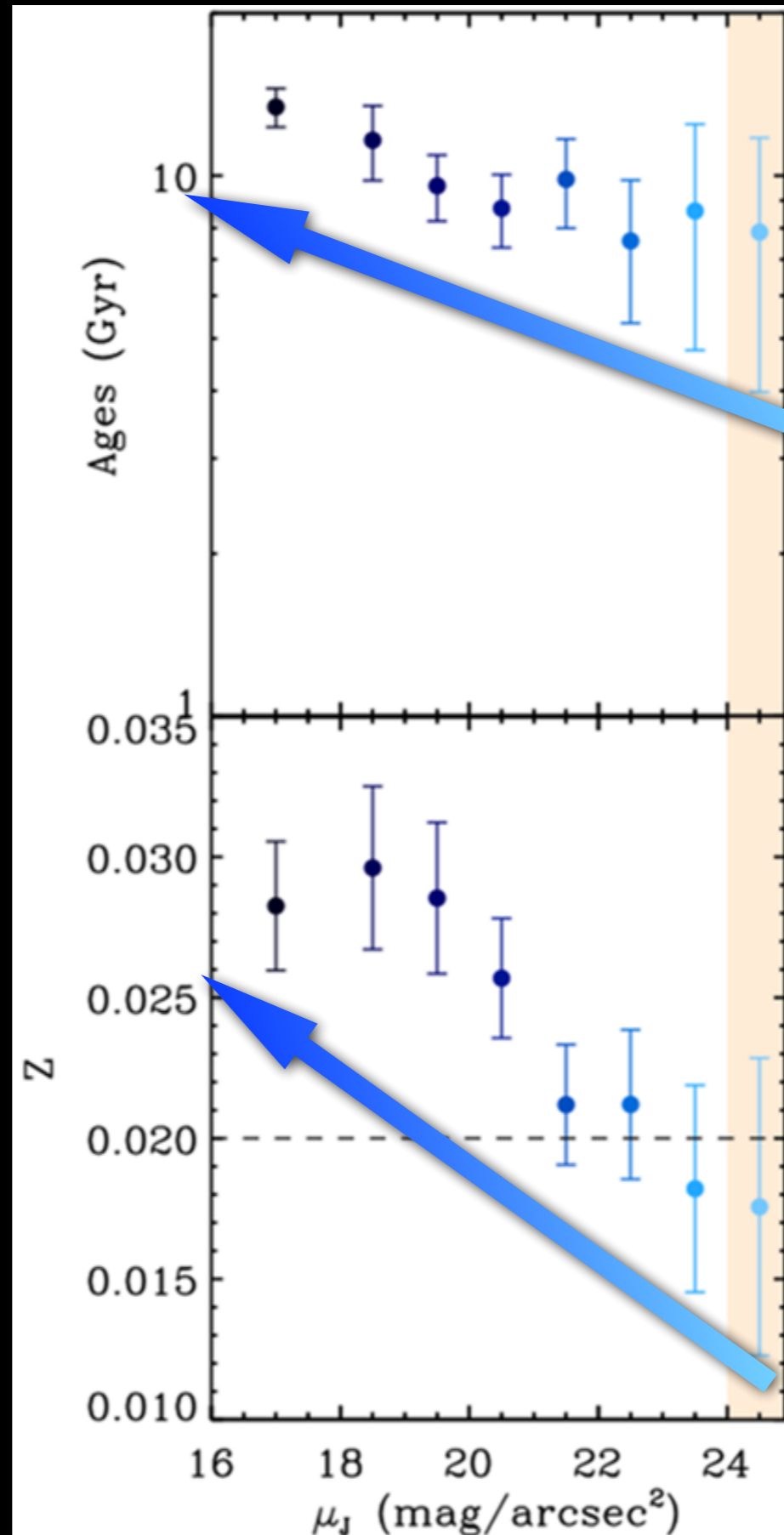
For density of stellar
mass
and radial distance
similar results





Gradient in age:
3–6 Gyr younger
in the outer parts.

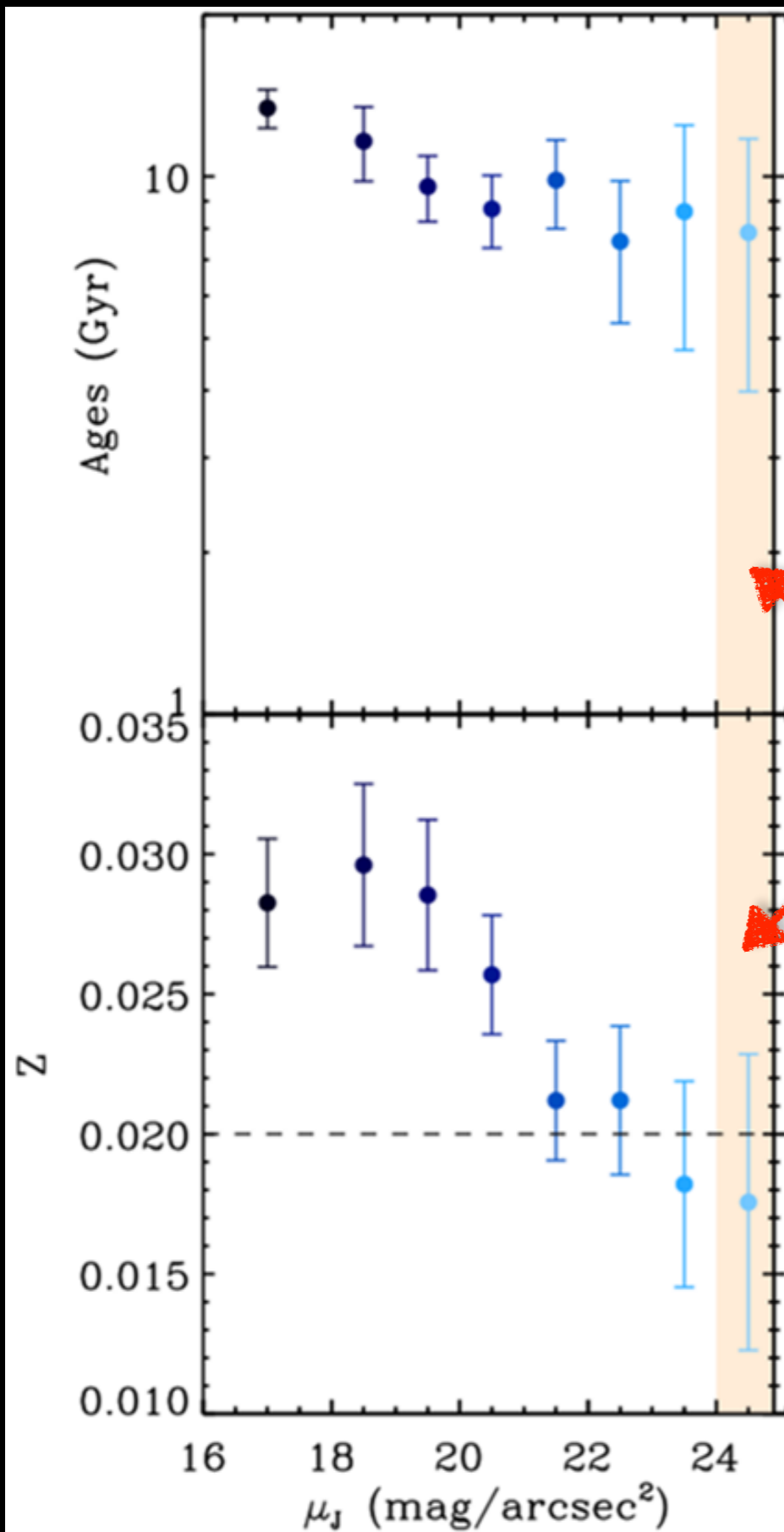
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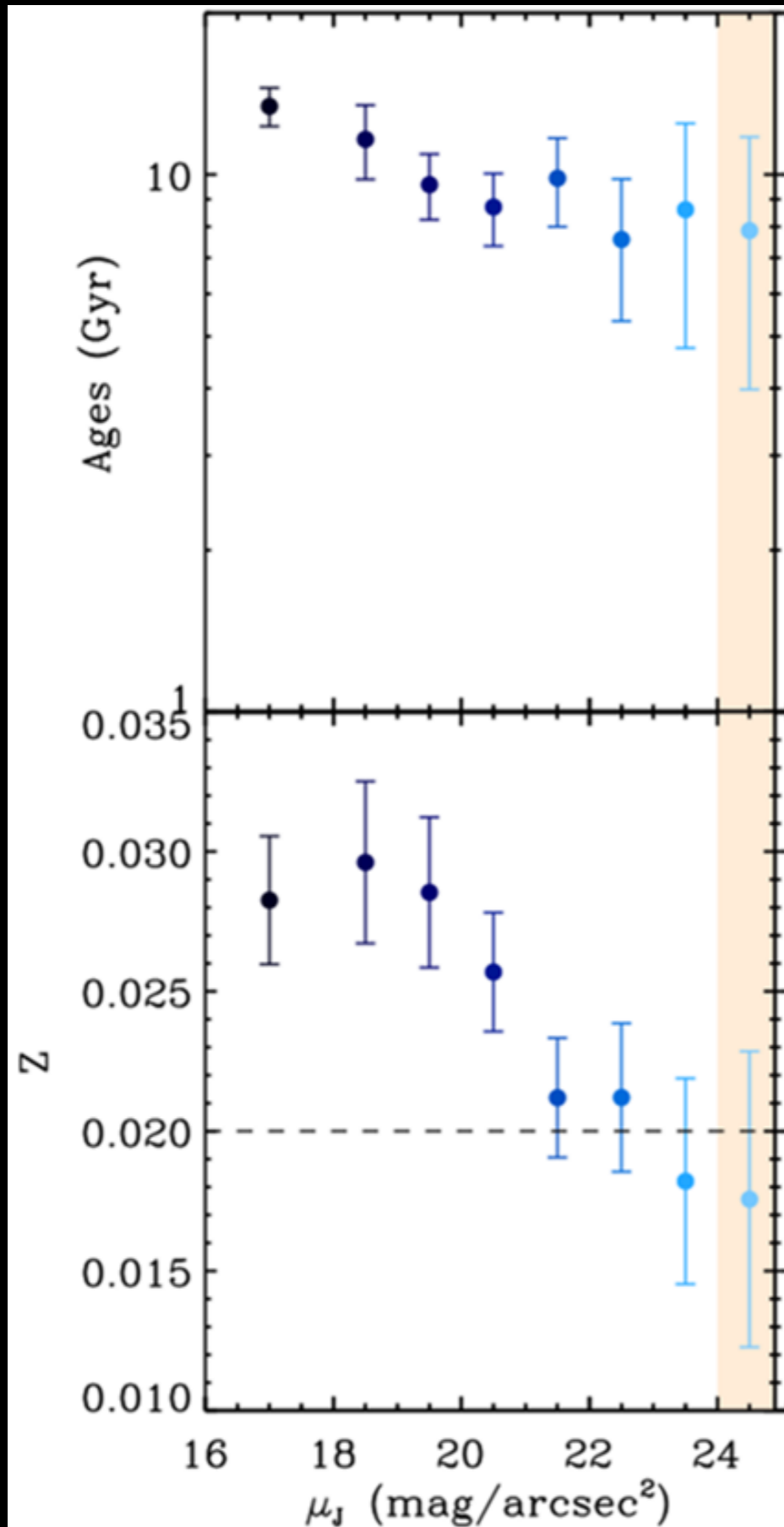
Gradient in met.
Supersolar
to ~ solar



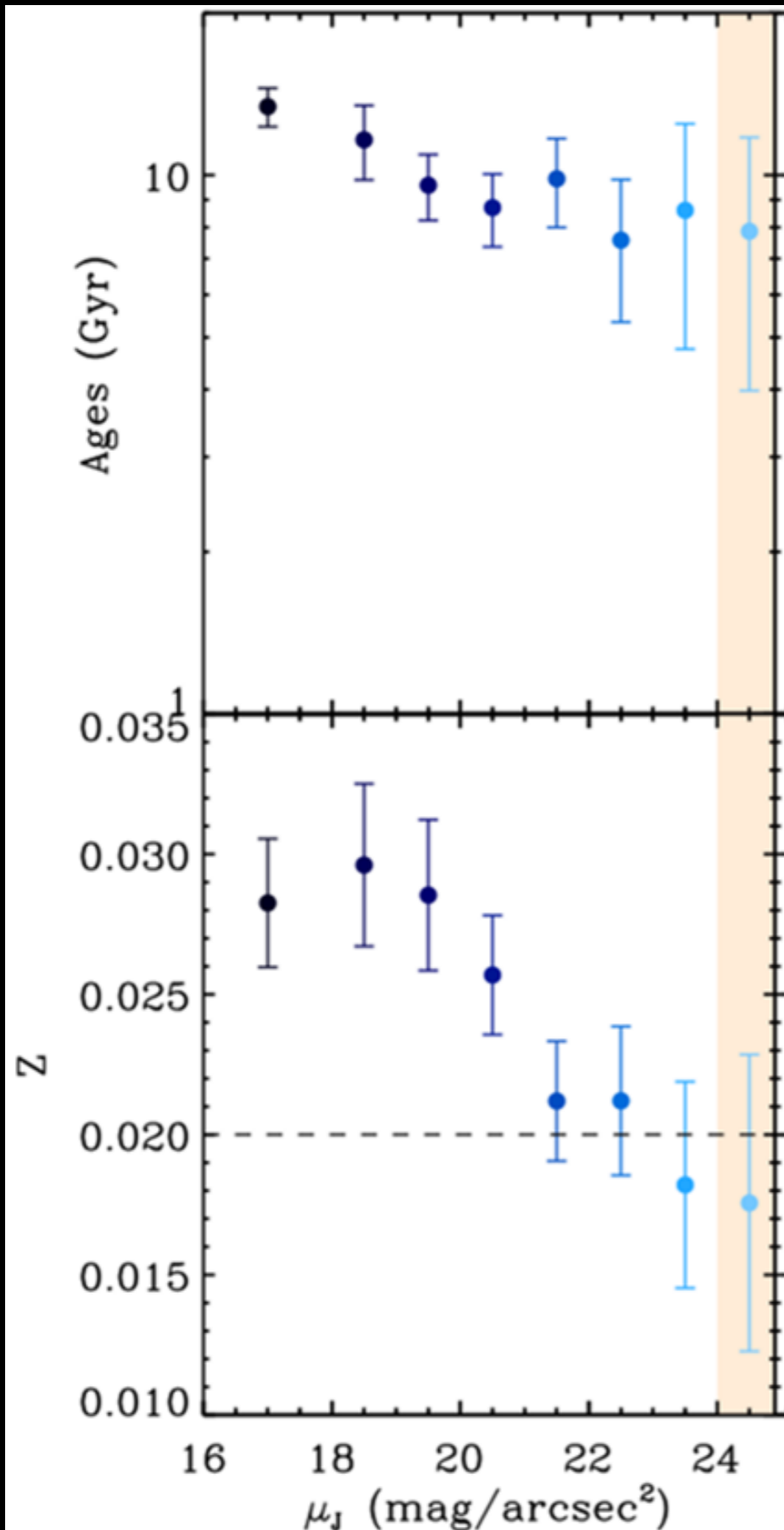
ICL

Younger
and
more metal-poor
than the most
massive galaxies

ICL vs. theoretical expectations

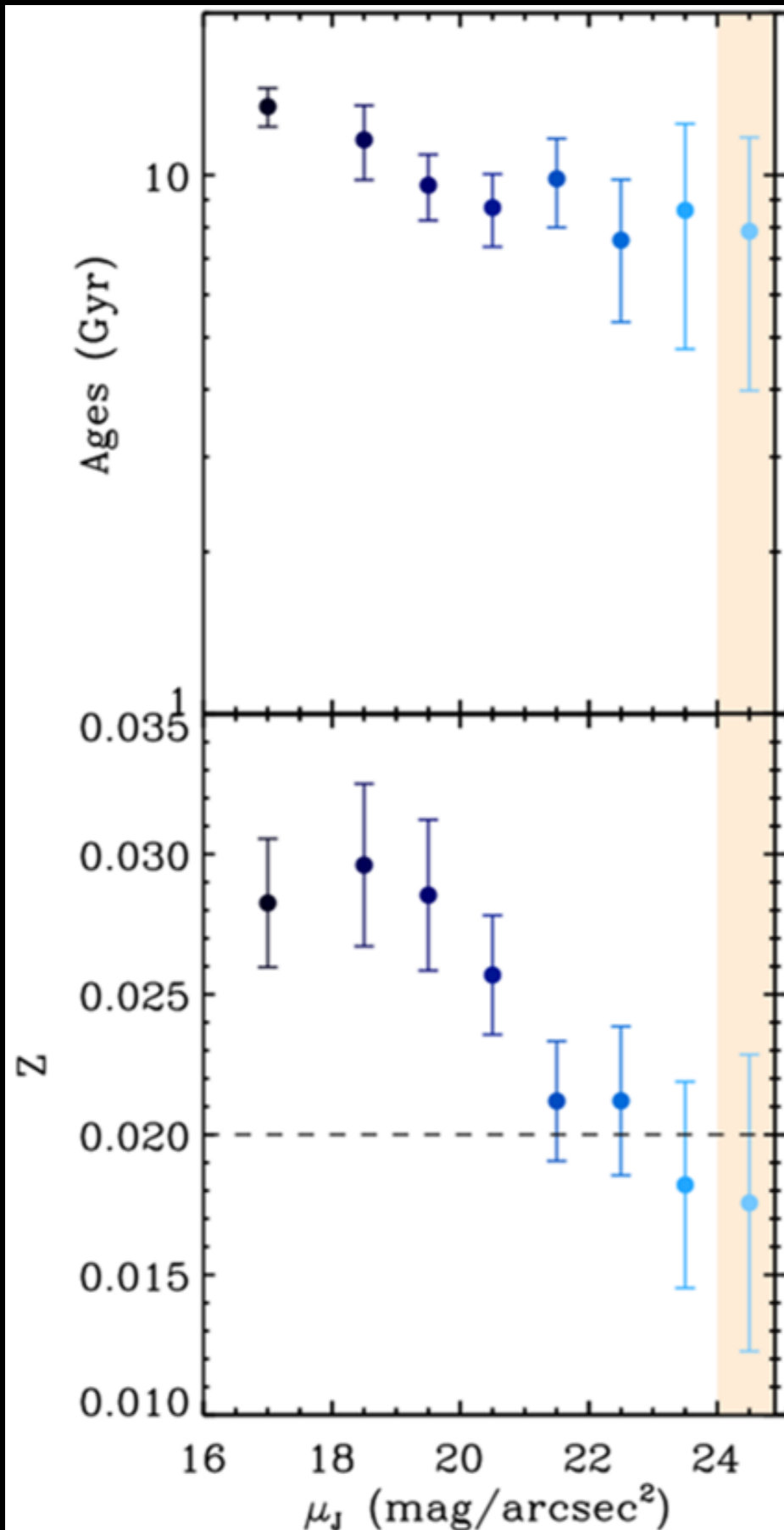


ICL vs. theoretical expectations



- ICL formed at $z < 1$
(Murante et al. 2007)

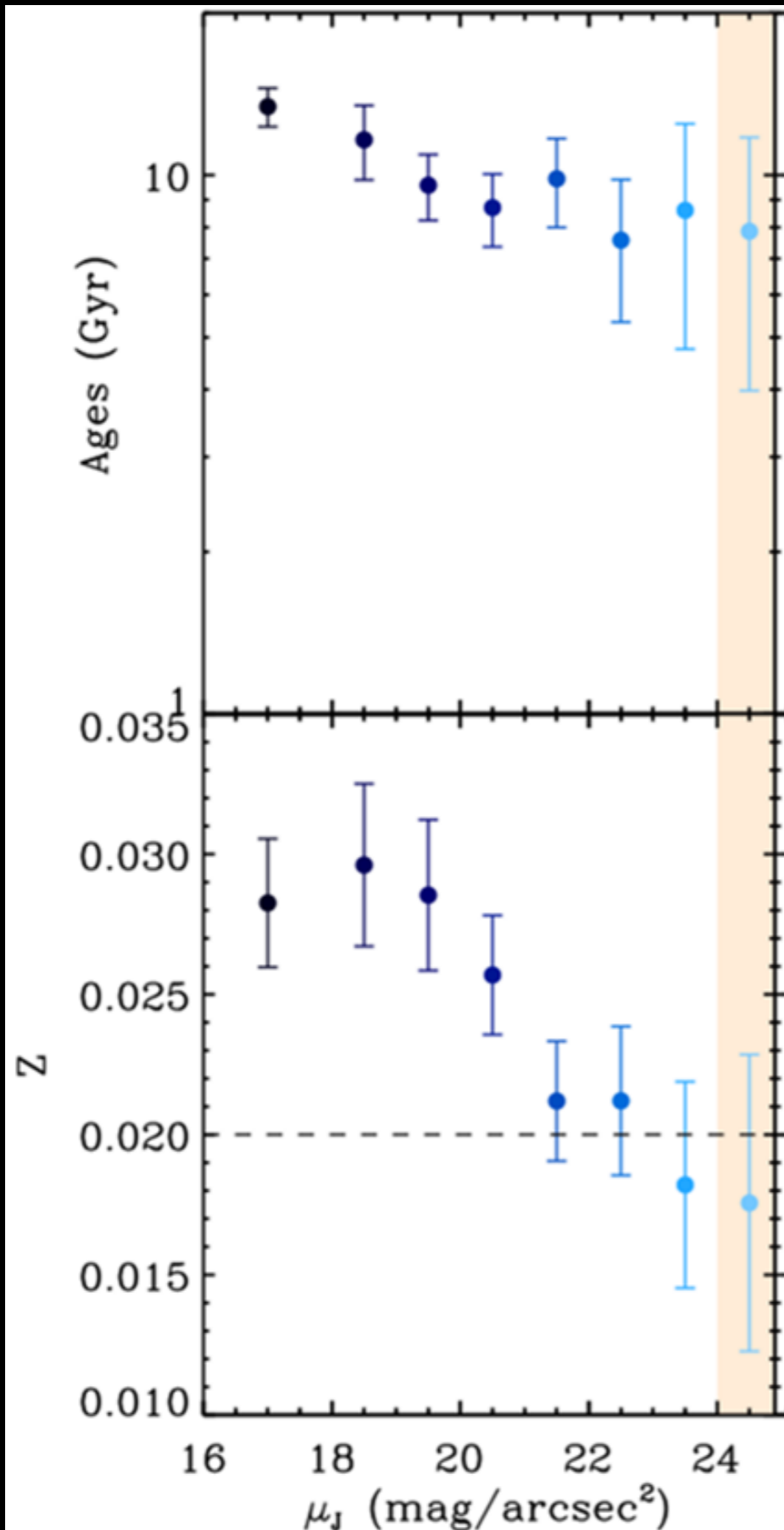
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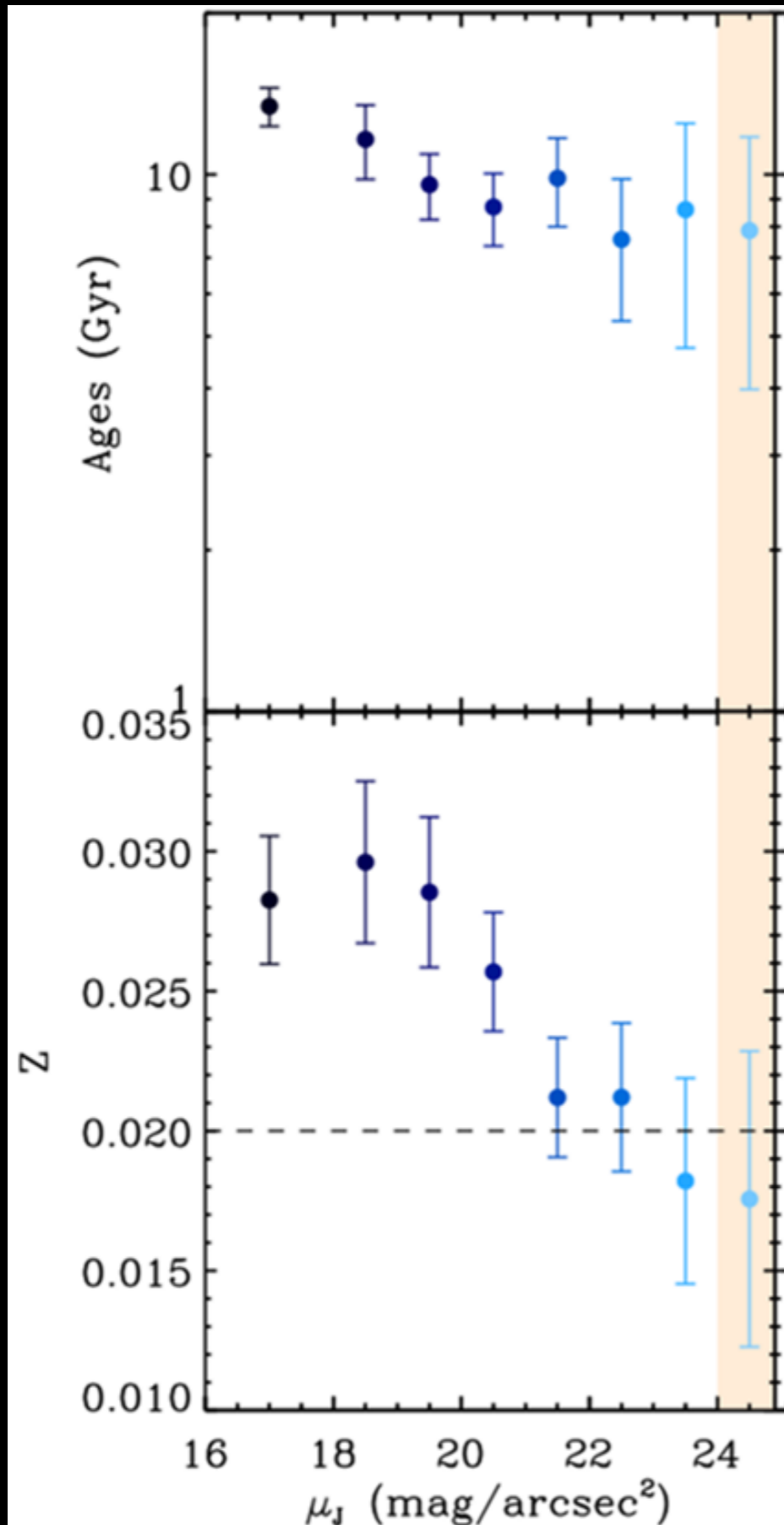
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- Produced by the most massive satellites ($\sim 10^{10-11}$ Msolar,
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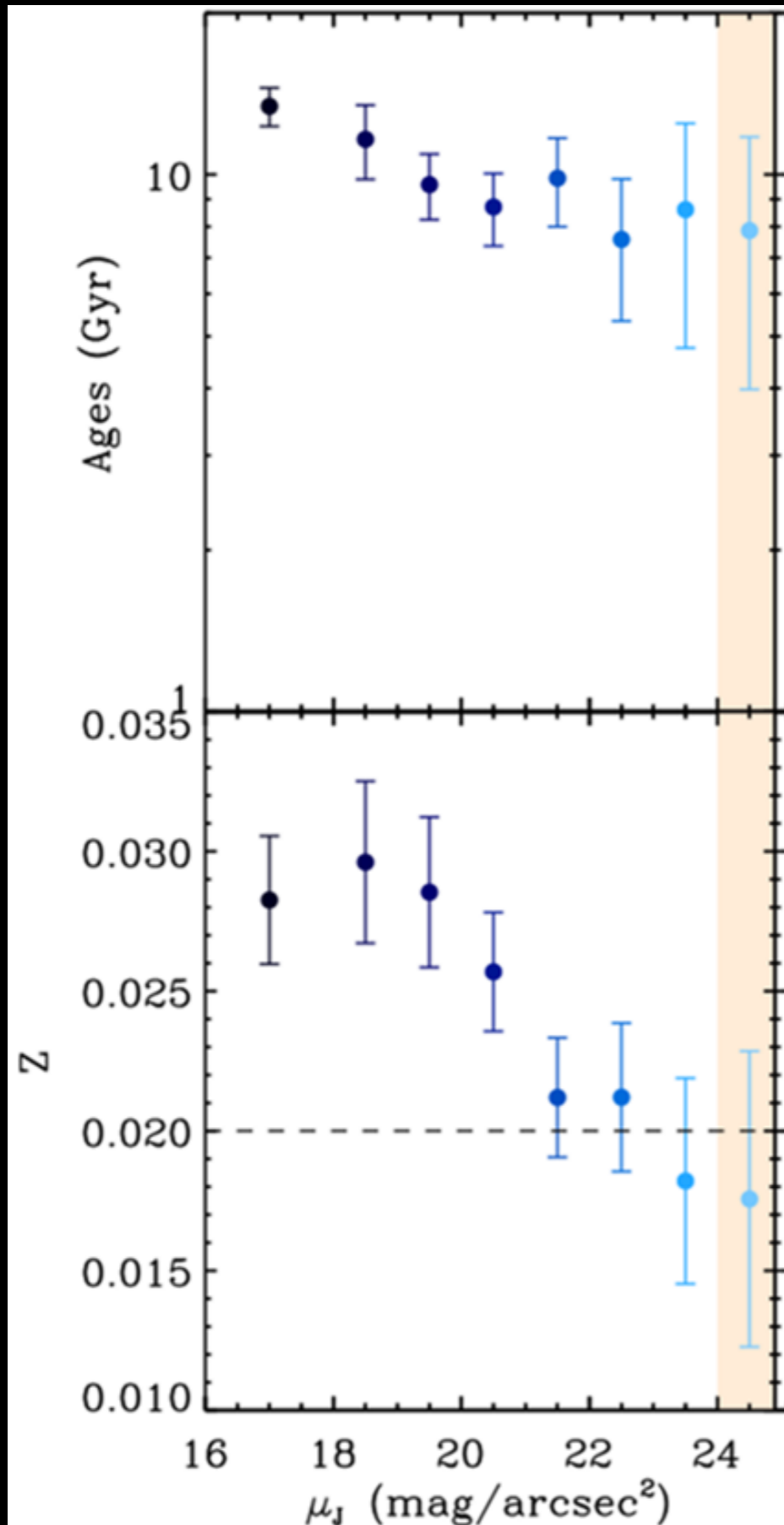


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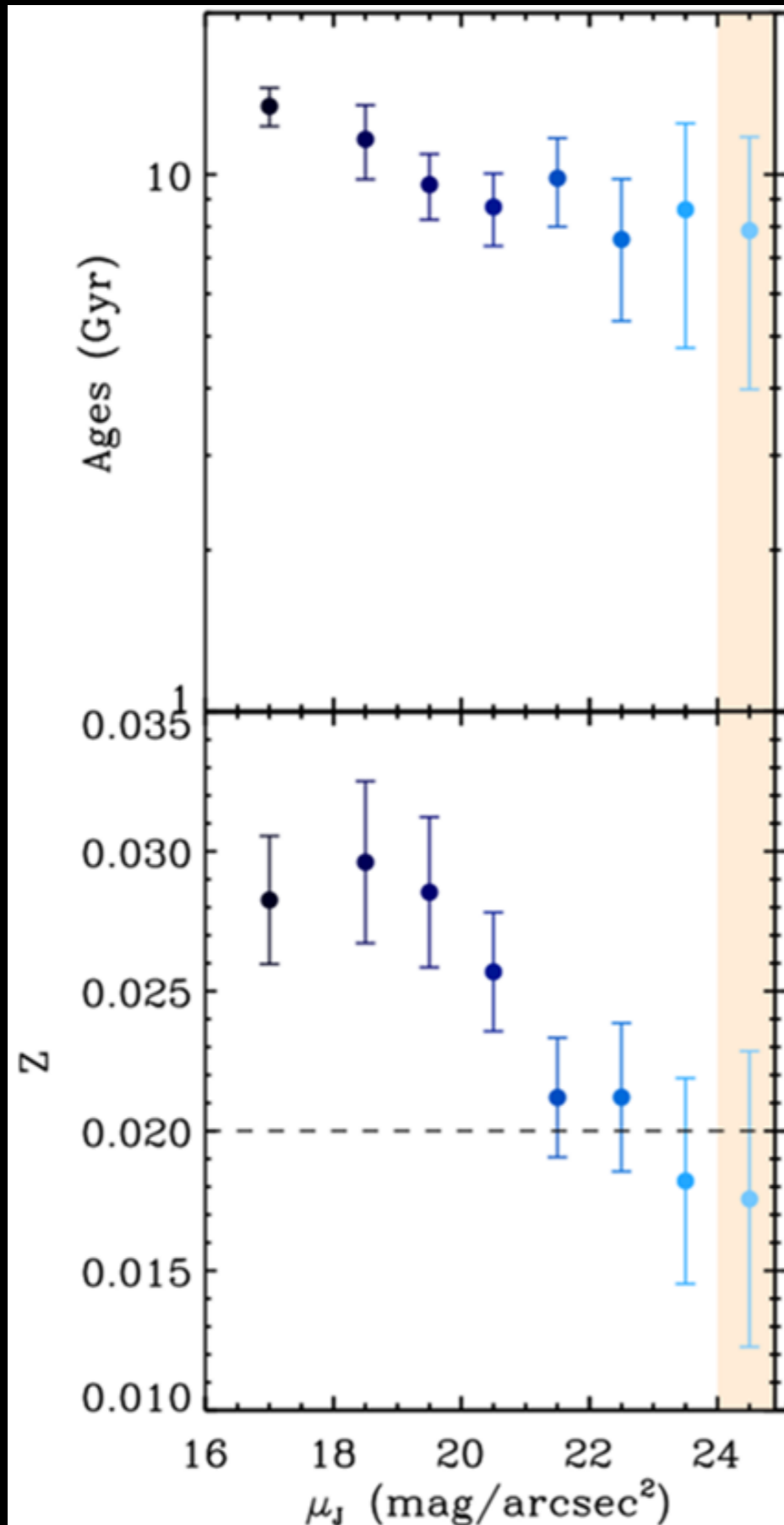
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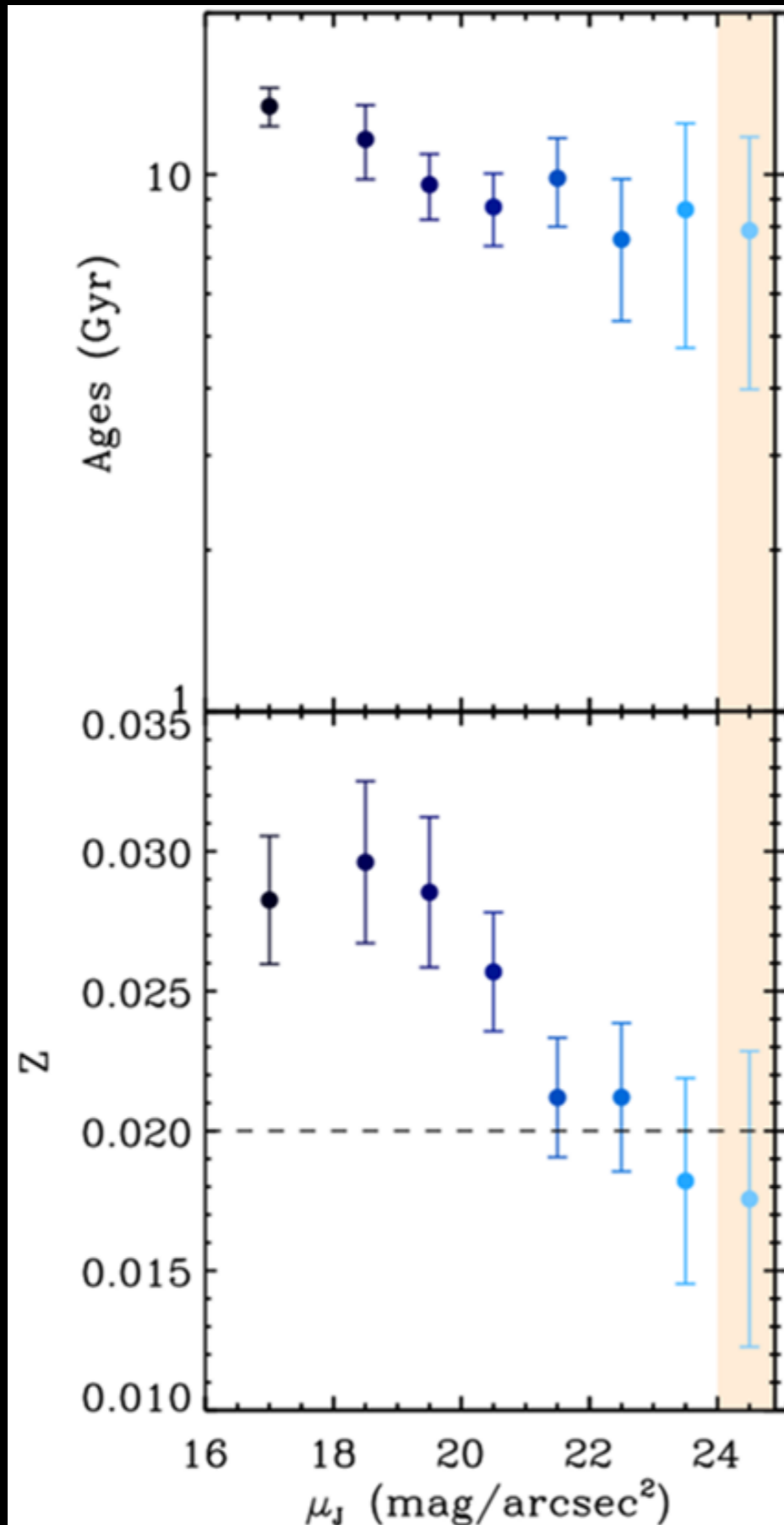
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- Mass fraction: $\sim 7\%$ of the total mass
 - at $z = 0.3$ (6–24%, Contini et al. 2014)

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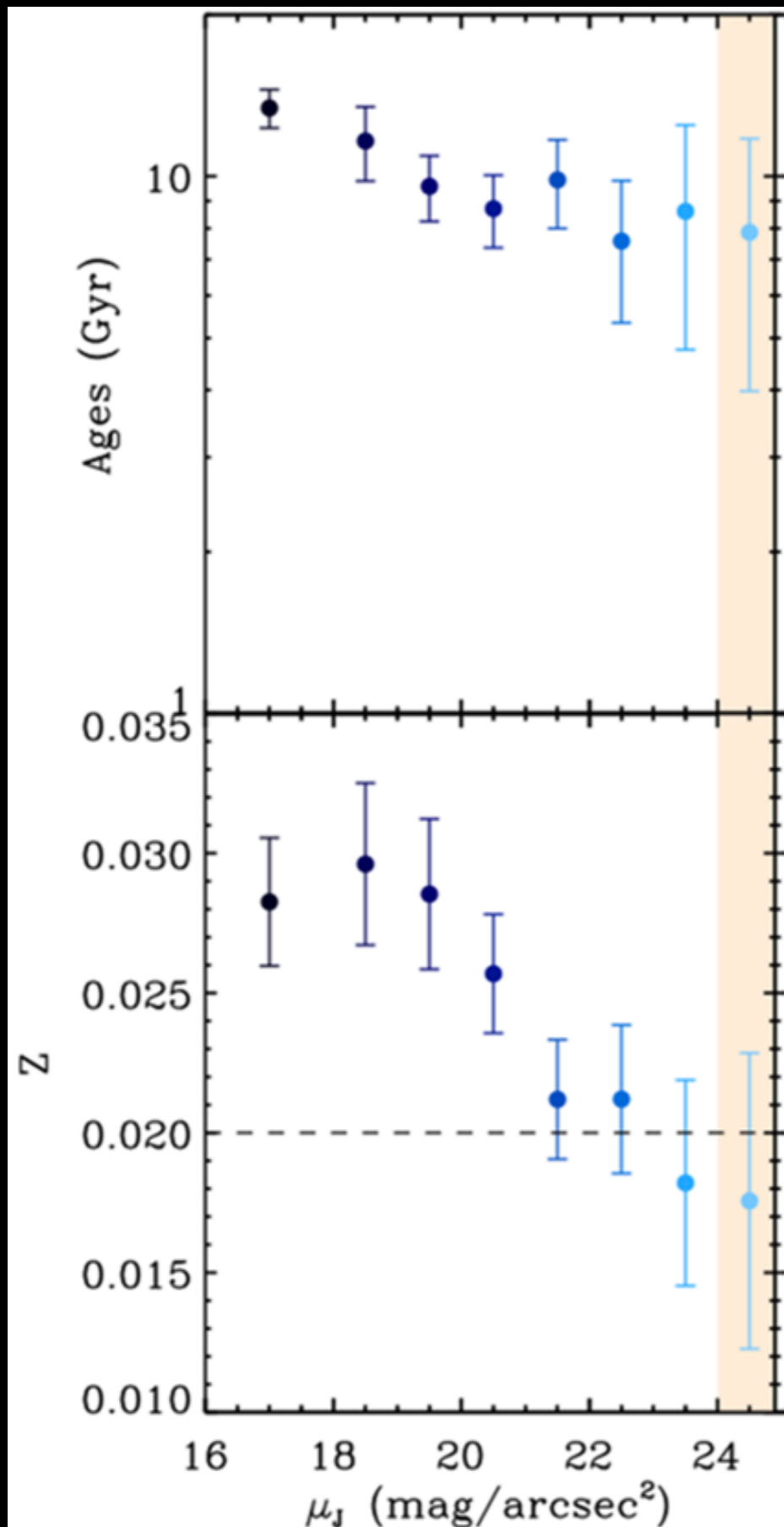


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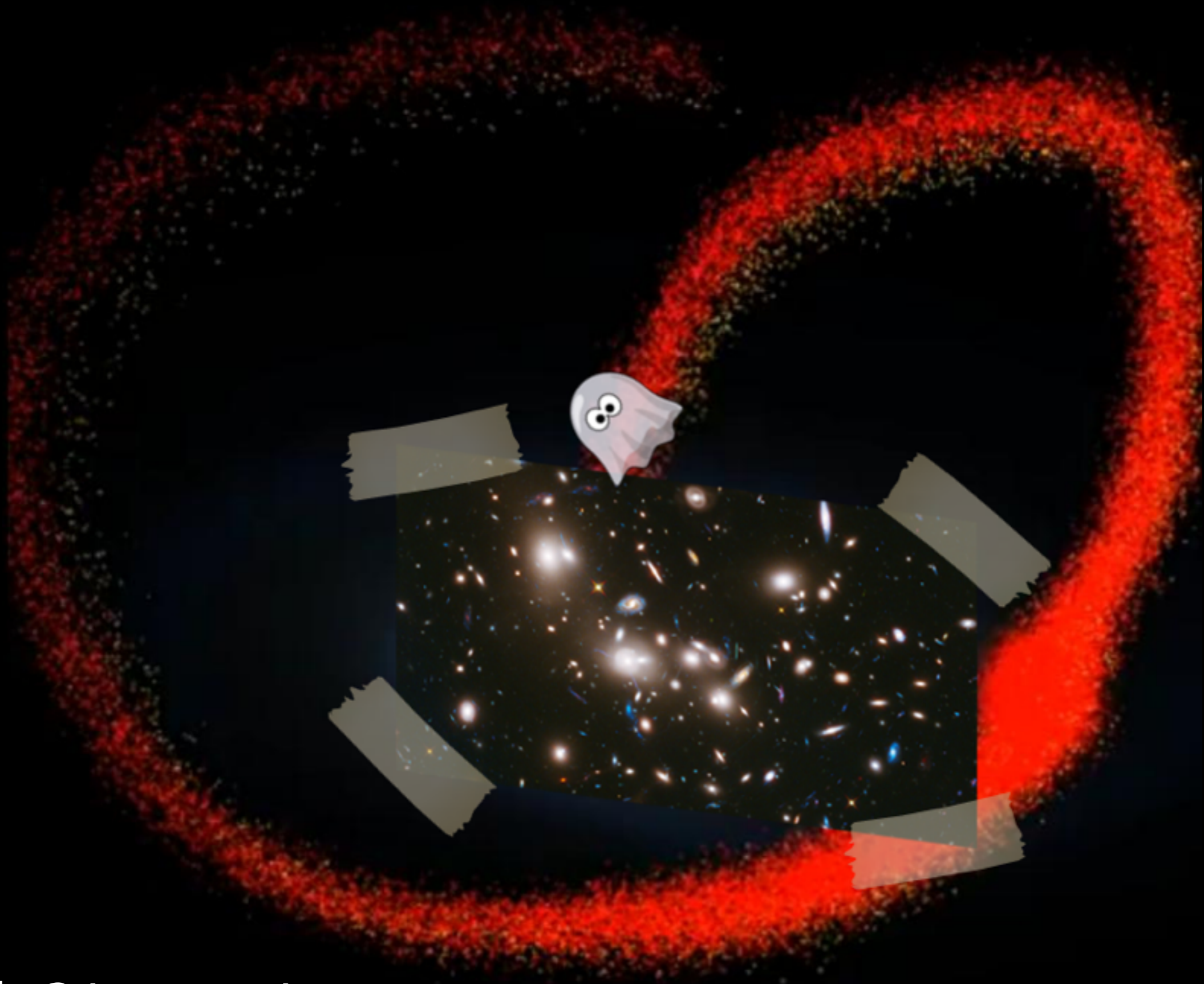


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 - equivalent to 5 Milky Ways murdered!

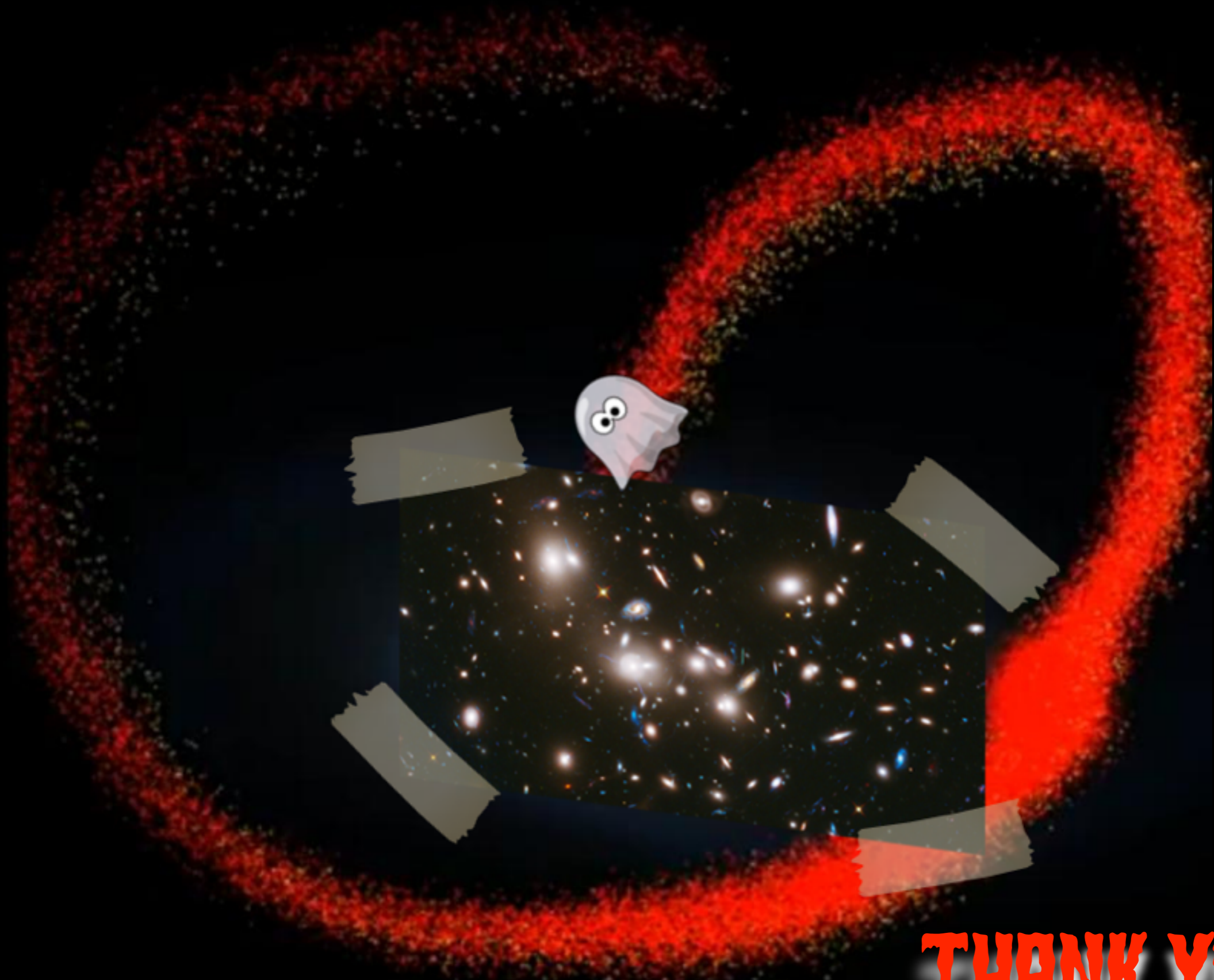


Scenario: MW-like galaxies
being accreted into the
cluster

Beginning to understand
the formation of the ICL



Artist's ? impression



Artist's ? impression

THANK YOU

