# *The Evolution of the Global Stellar Mass Density at 0<z<3*

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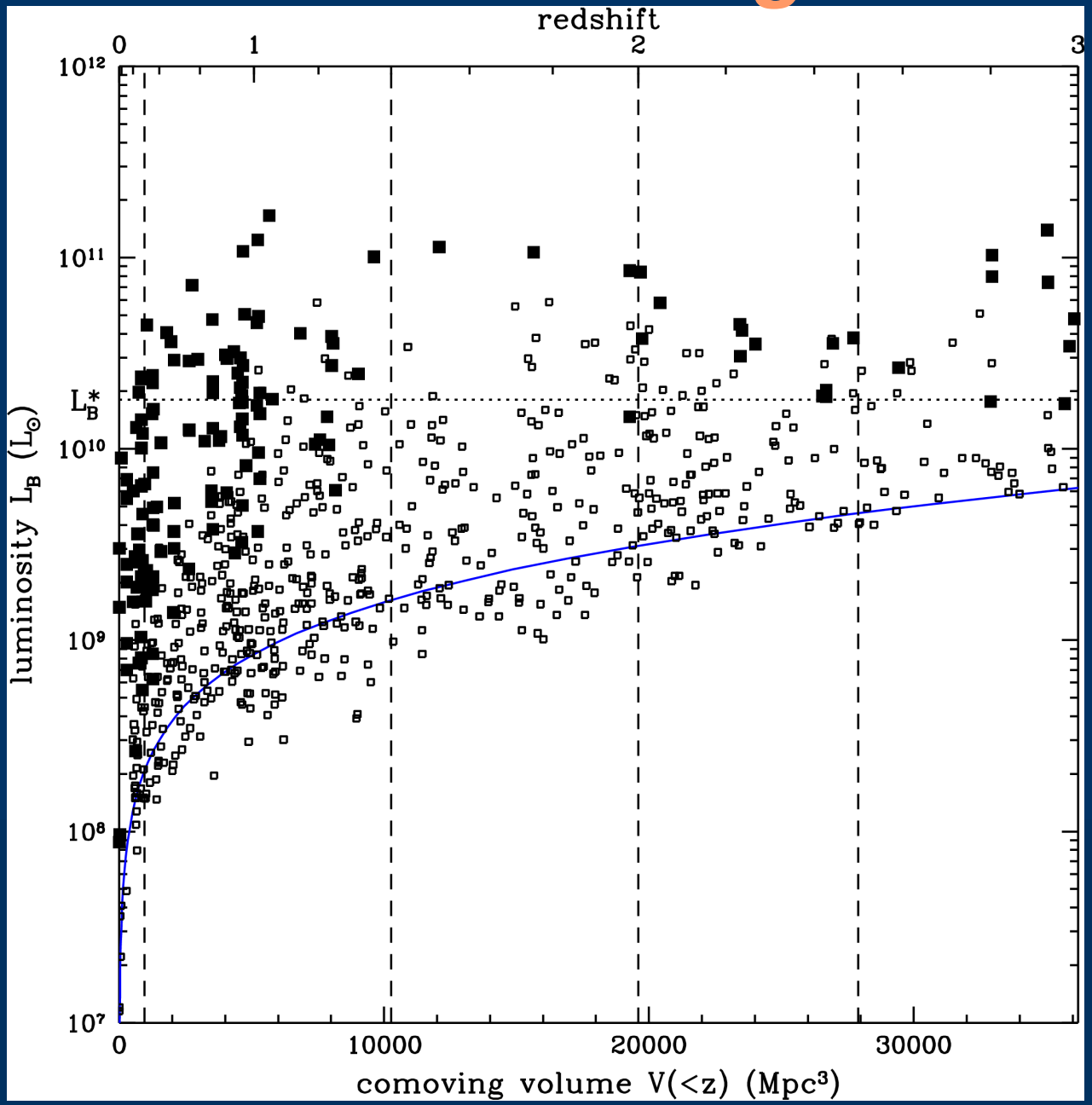
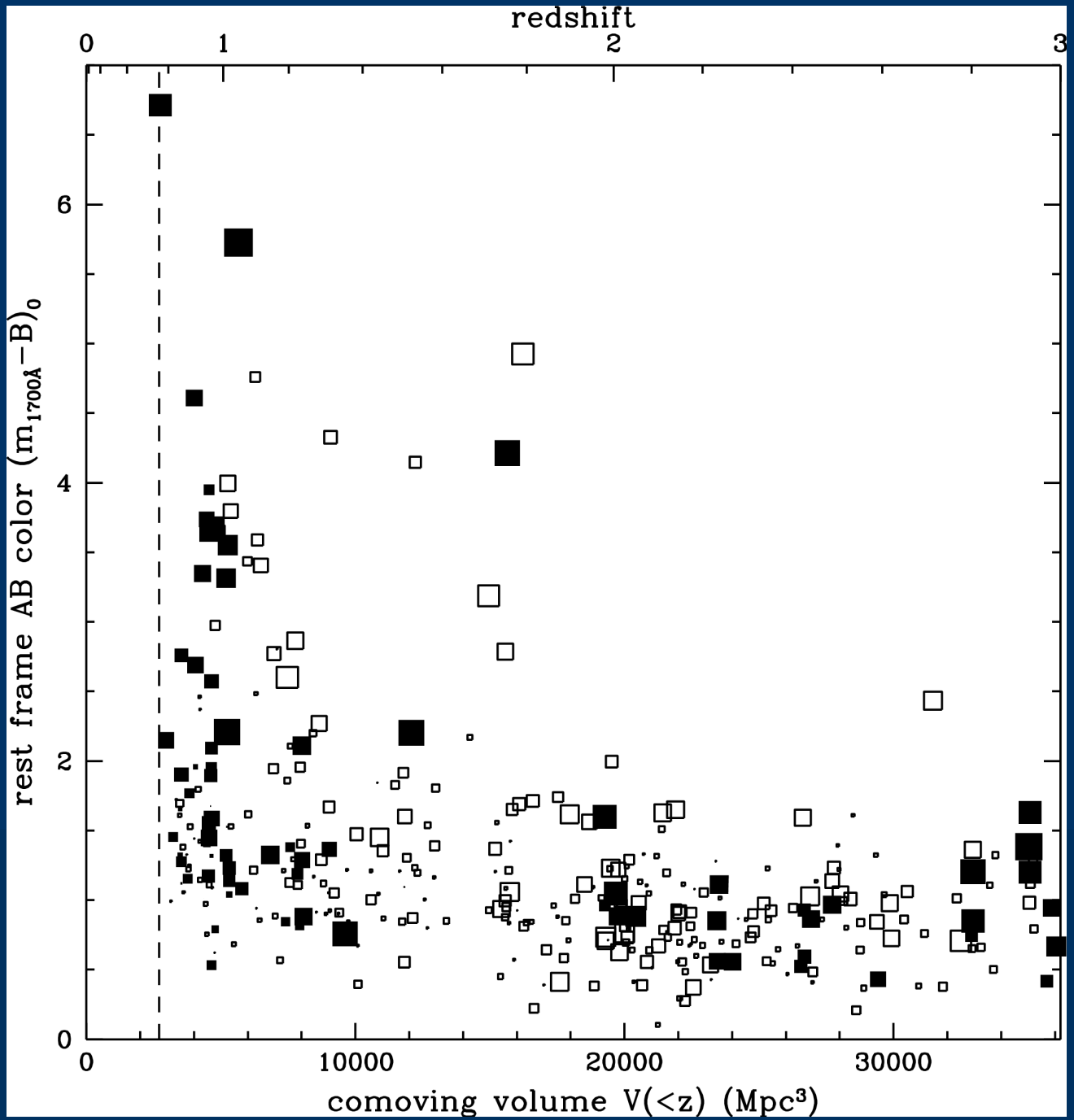
# Comoving Density of Luminous Galaxies changes little for 0<z<3



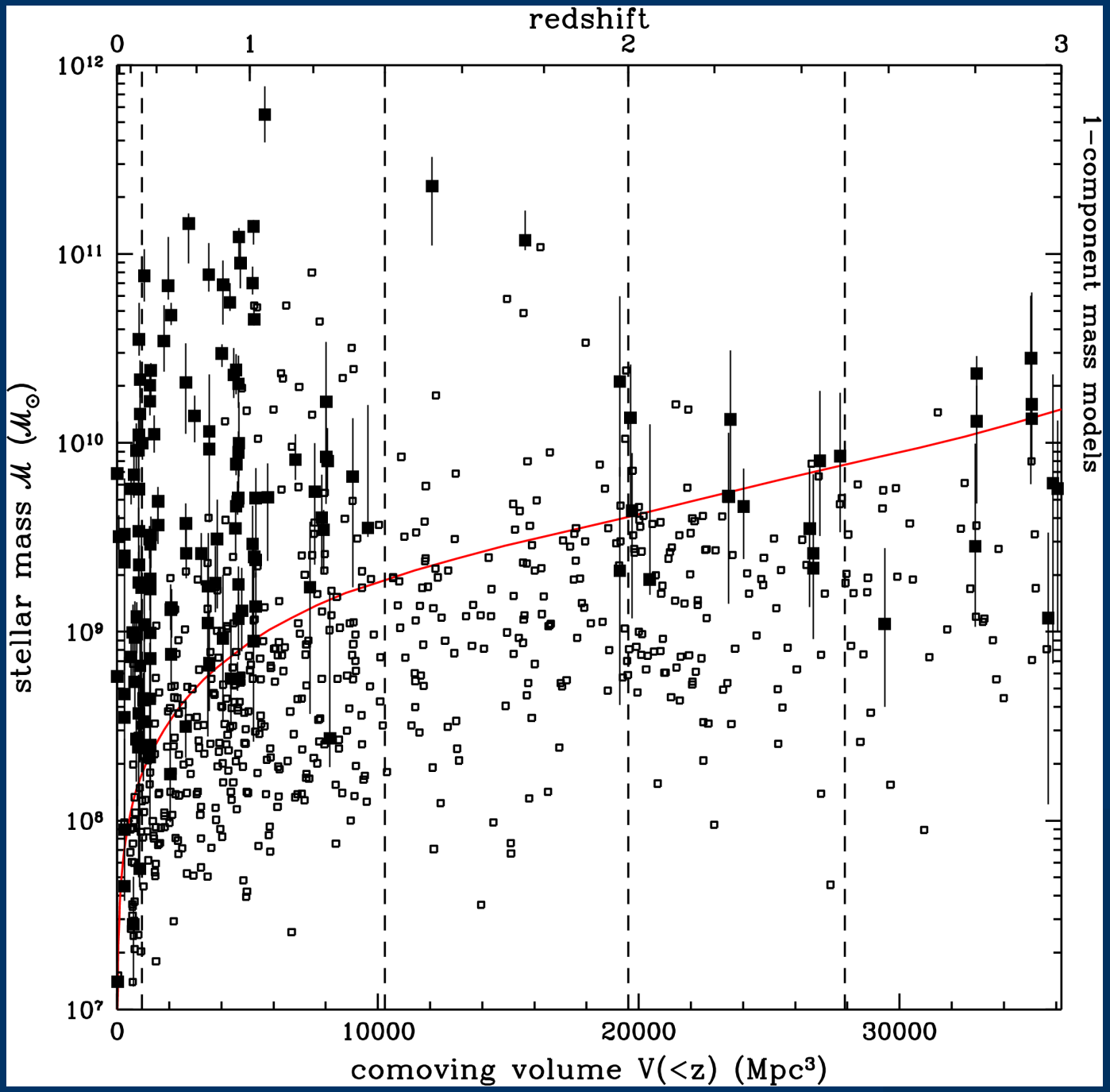

Blue line shows the flux-limited survey completeness limit

# The UV-Optical color DOES change



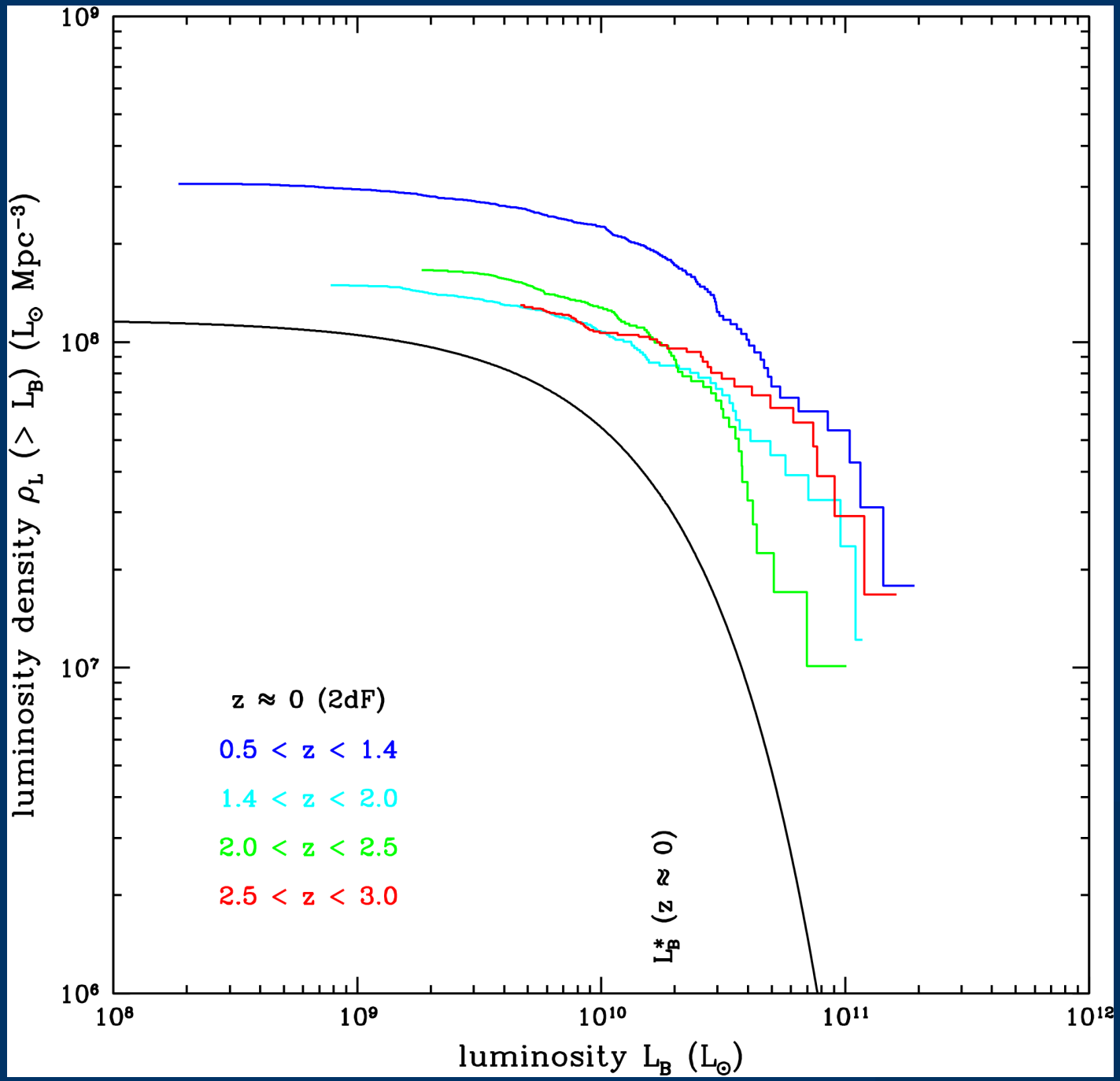

High Redshift galaxies tend to be bluer than local galaxies.

# Galaxy stellar mass vs. redshift

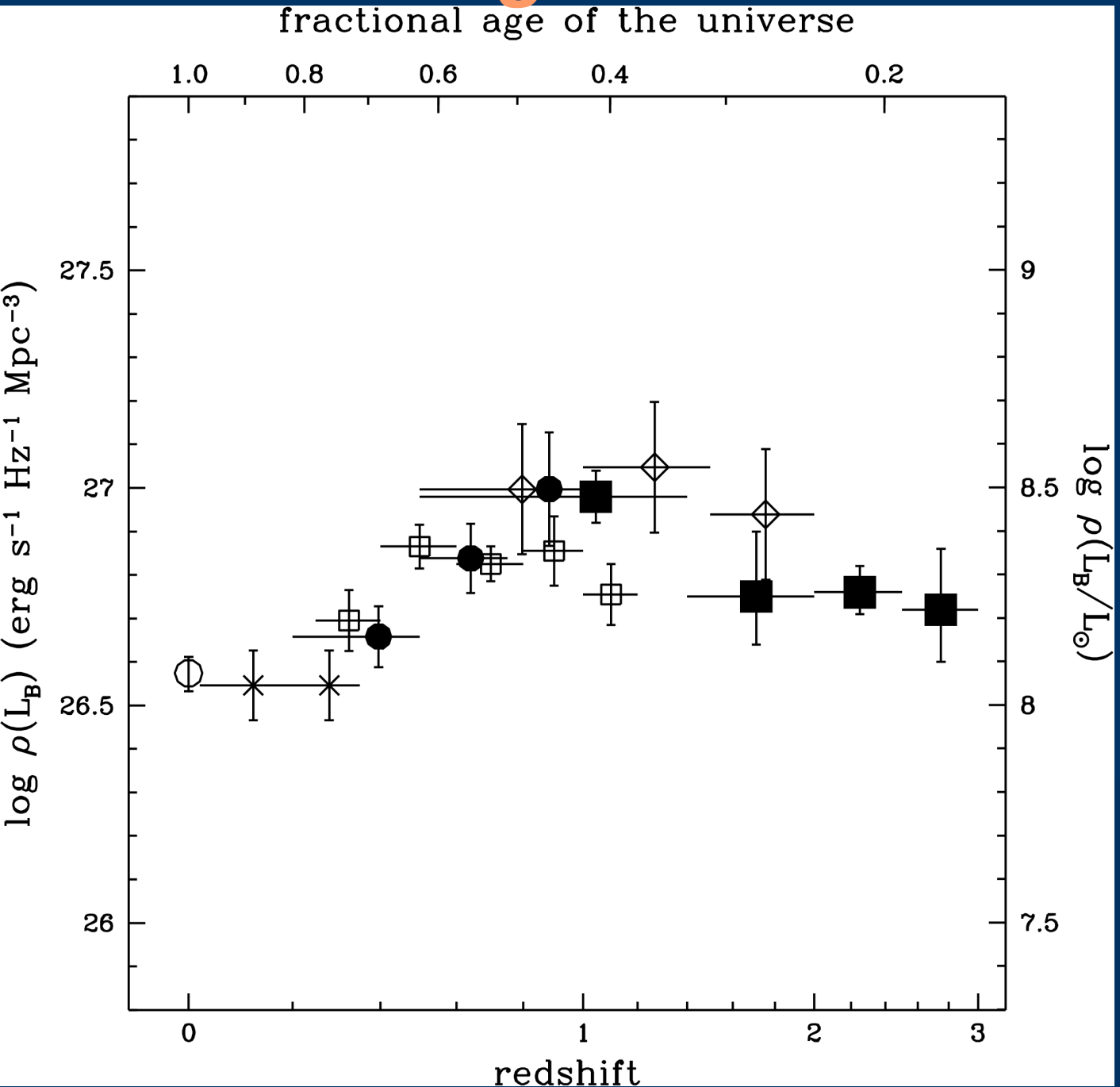



Line shows completeness of "Maximally Old" model

# Do the calculations converge?

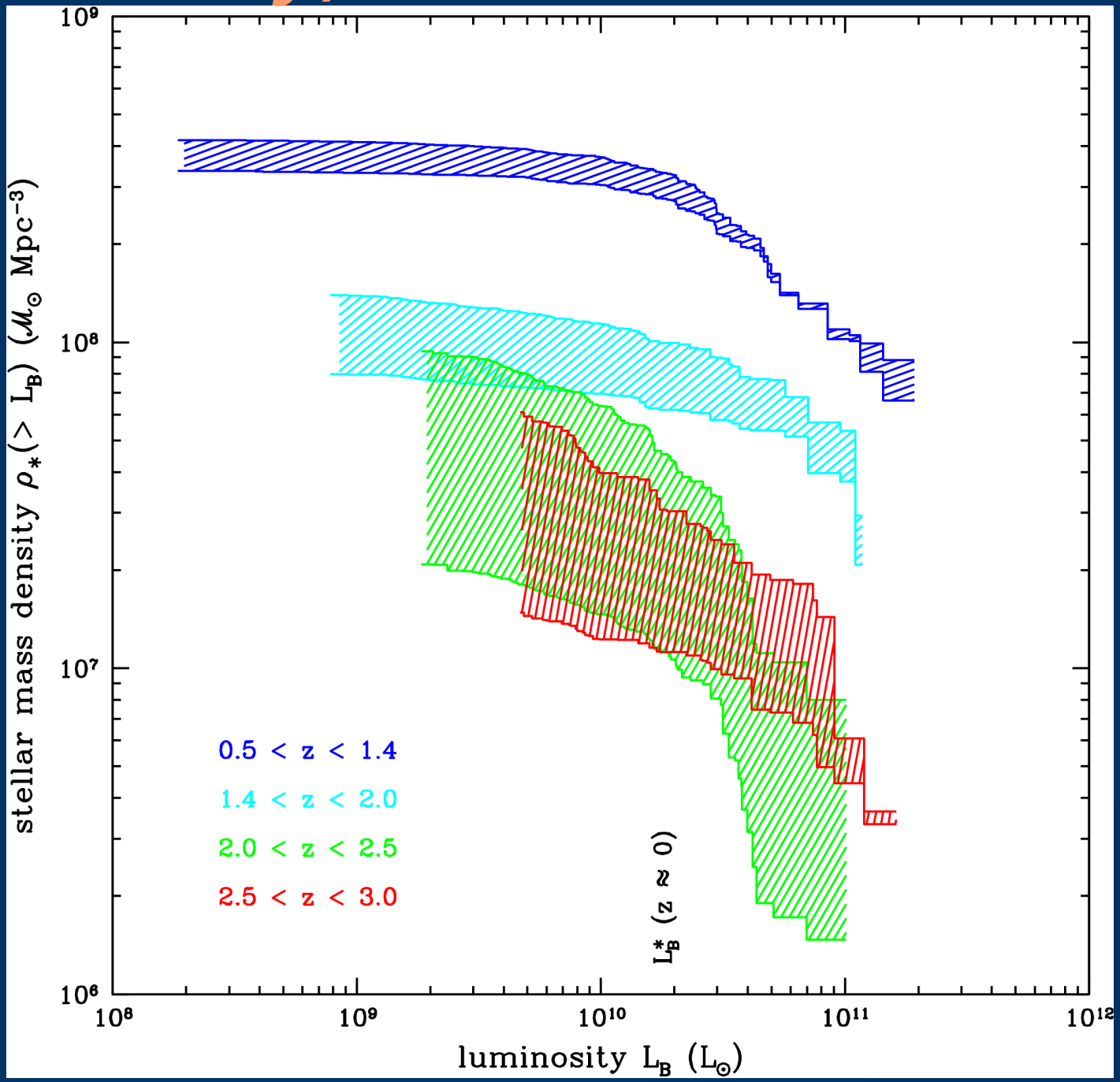


# Luminosity density – Nothing too exciting here



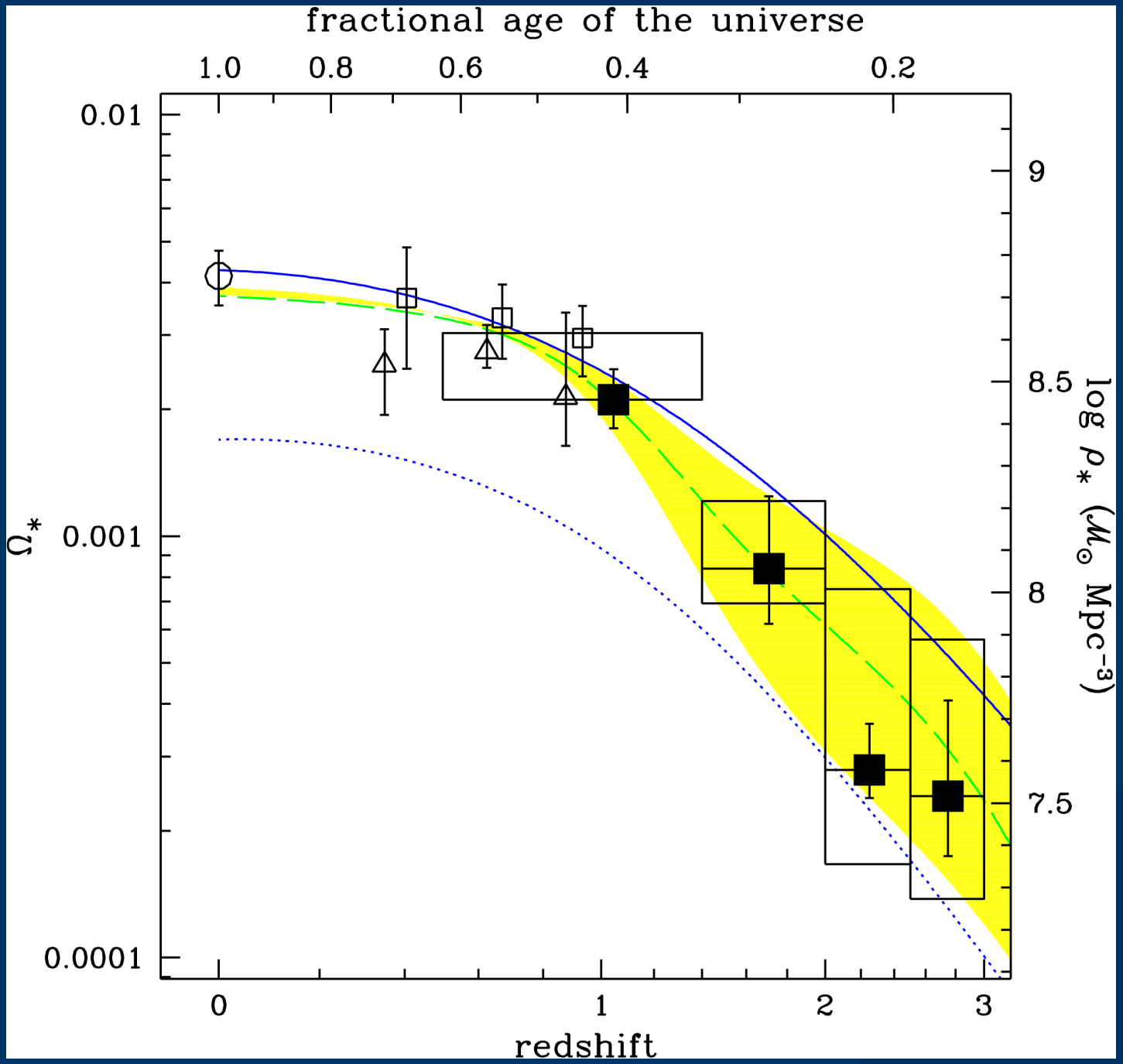

Black Squares are new data, others are from the literature.

# *Finally, Stellar Mass density*

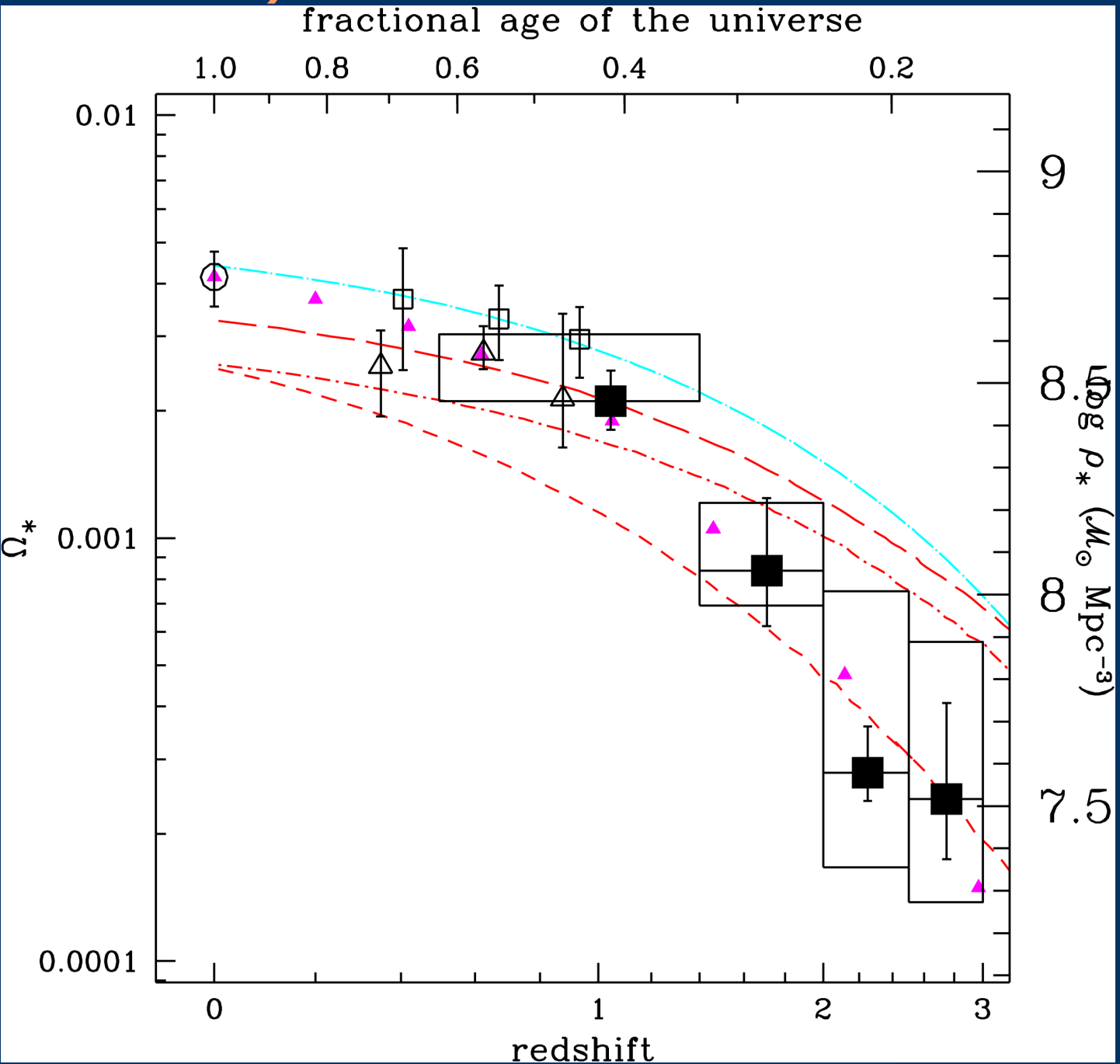



Now they find a clear difference between redshift bins

# Comoving Stellar Mass Density



# Many people have models, some work, some don't



# *Interesting Question:*

According to this, very little of the present day stellar mass was around at redshift ~3. Others find active populations of LBGs at z >3. Also the re-ionizing radiation was emitted at z >3 (which presumably was created via star formation), so why are there so few stars formed by z~3?

Possible solution:
Maybe the Initial Mass Function (IMF) was different for those stars than the subsequent generations.

## *Interesting Question:*

Evidence shows that spheroids contain >30% of the stars in the local universe, and those stars formed at high redshift (Renzini 1999). Also, SDSS estimates >50% of local stellar mass density is in red galaxies. According to Dickinson (et al. 2002) only <20% of the of present day stellar mass was in place at $2<z<3$, is this a contradiction?

Possible solution:

Stars won't fit in your universe? Get a new universe! Modern world models use ΛCDM cosmology and allow for more proper time per redshift than other models.

# *Conclusions*

The global stellar mass density was changing rapidly around z=2.7. It rises to its present value by z=1, then changes little since then (half the age of universe).

This study agrees with the integrated cosmic star formation RATE as traced by rest frame UV light (Pei, Fall & Hauser 1999). This shows promise, because at least the data is self consistent even if the models are not there yet.