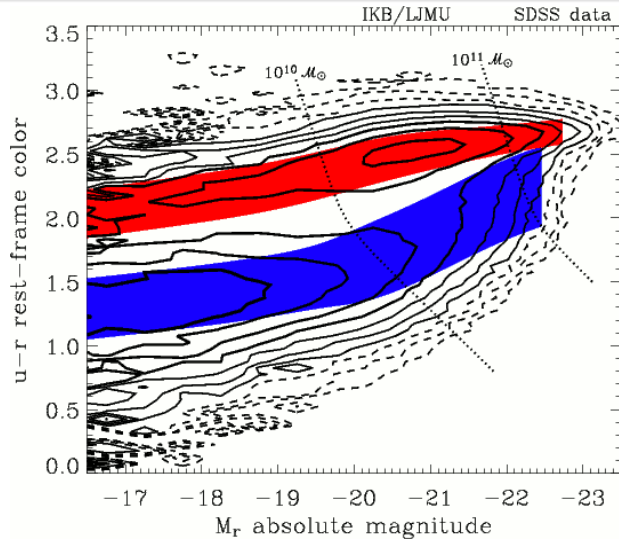


Galactic ageing and quenching over the last 10 billion years

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&
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NUVA e-meeting, 08/10/2026

Galaxy bimodality



What is a “passive” galaxy?

“Red and dead”

- Star forming: $SFR > 0$
- Passive: $SFR = 0$

“Main sequence” of star formation

$$SFR(M)$$

“Green valley”

$$SFR = 0$$

Quenching

Arbitrary threshold in $sSFR \equiv SFR/M$

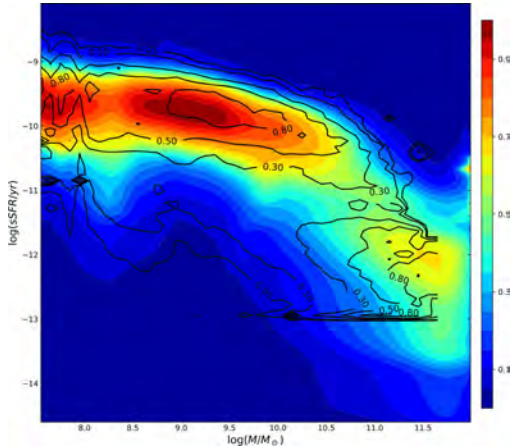
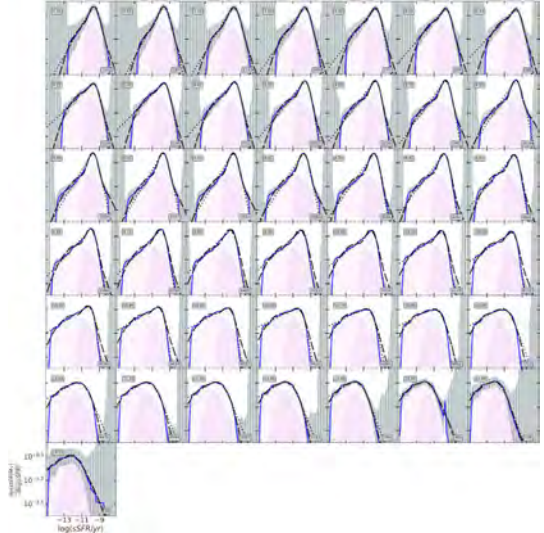
- Star forming: $sSFR > 10^{-11} \text{ yr}^{-1}$
- Passive: $sSFR < 10^{-11} \text{ yr}^{-1}$

Arbitrary thresholds in $b \equiv SFR t/M$

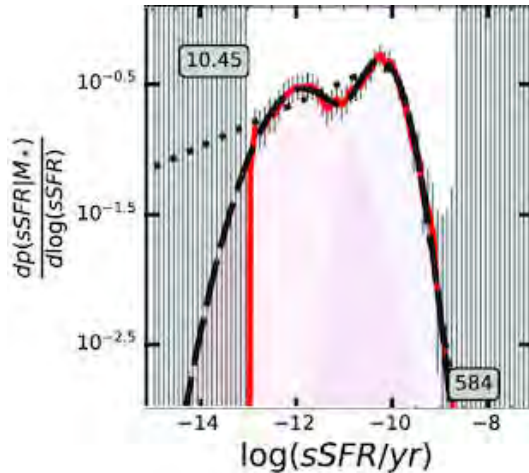
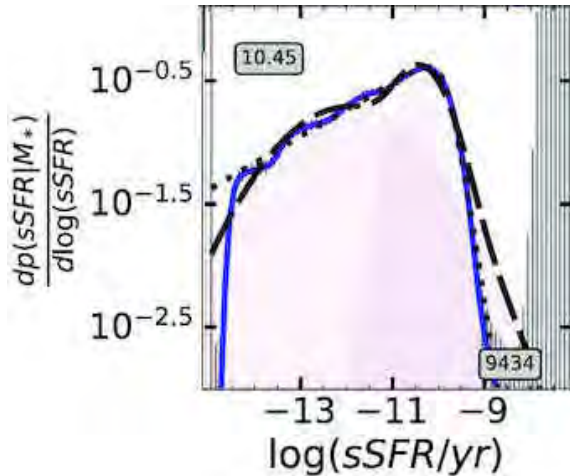
- Starburst: $b > 2$
- Main sequence: $1/2 < b < 2$
- Transition/green valley: $1/20 < b < 1/2$
- Quiescent: $b < 1/20$

Ageing

Conditional probability distribution $p(sSFR|M)$



Conditional probability distribution $p(sSFR|M)$

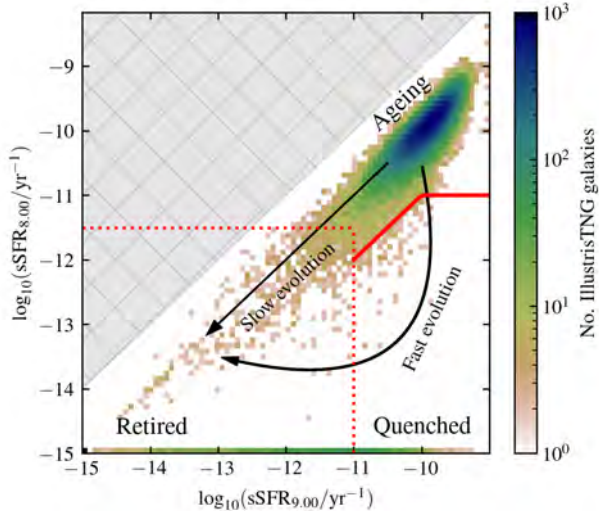


Measuring low sSFR

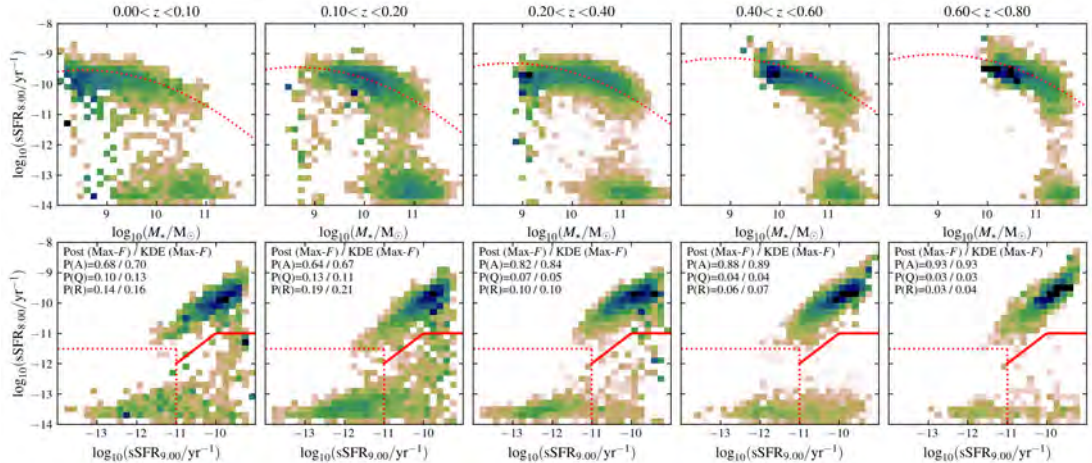
Stars younger than 30 Myr

$$M_{< 30 \text{ Myr}} = (10^{10.5} \text{ M}_{\odot}) \times (10^{-13} \text{ yr}^{-1}) \times (10^{7.5} \text{ yr}) = 10^5 \text{ M}_{\odot}$$

Classification of ageing and quenching galaxies

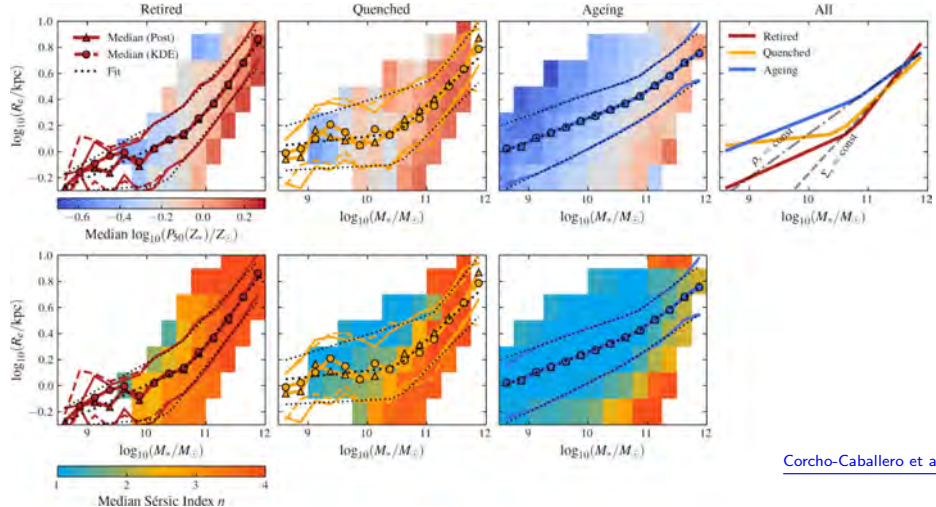


Ageing and quenching as a function of time



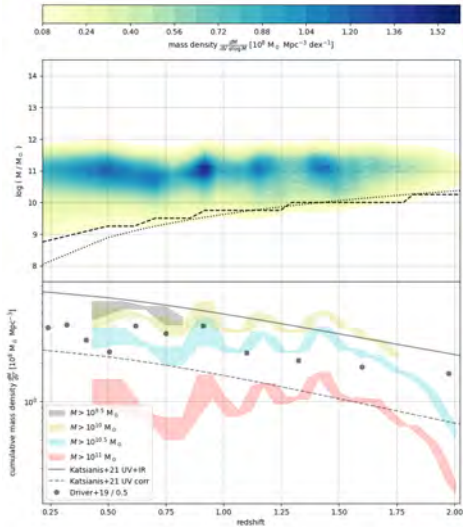
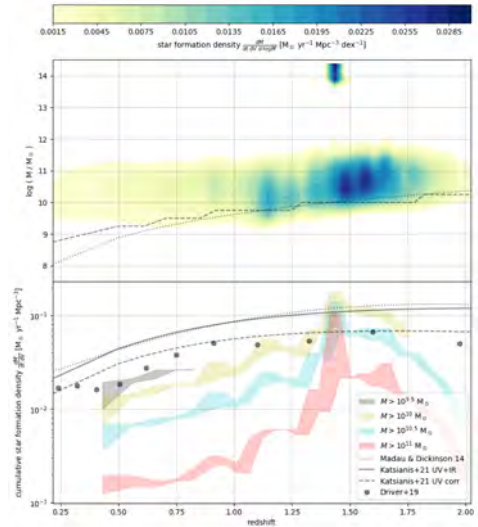
[Corcho-Caballero et al. \(2026\)](#)

Stellar radius, metallicity, and morphology



[Corcho-Caballero et al. \(2026\)](#)

The build-up of stellar mass



Summary

Improved measurements

- Photometry
 - Photo-z
 - Recent SFR
- Spectroscopy
 - Recent SFR
 - Warm gas
- Improved theory

Science cases

- Do galaxies die?
- How many stars do they form as they age?
- How many undergo quenching?
- What are the physical drivers?
- What is the contribution of mergers?
- What are the properties of the warm gas?

Thank you!