

CARBON ENVELOPES AROUND MERGING GALAXIES AT $z \sim 4.5$

submitted to A&A

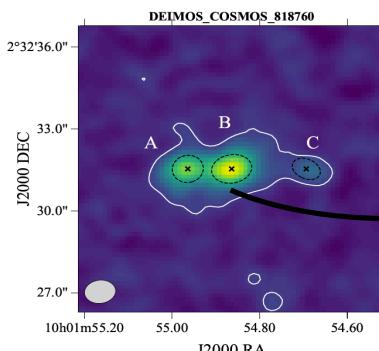
Claudia Di Cesare (Sapienza and ISTA)

With Michele Ginolfi (UniFi), Luca Graziani (Sapienza), Raffaella Schneider (Sapienza), Micael Romano (NCBJ) and Gergö Popping (ESO)

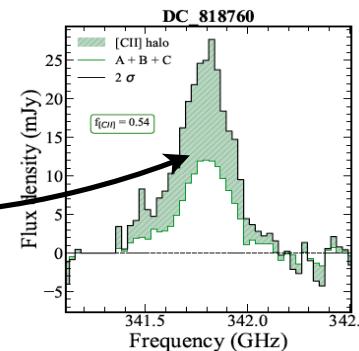


OBSERVATIONS from the ALMA-ALPINE survey

six major merging systems $4.4 \leq z \leq 5.9$



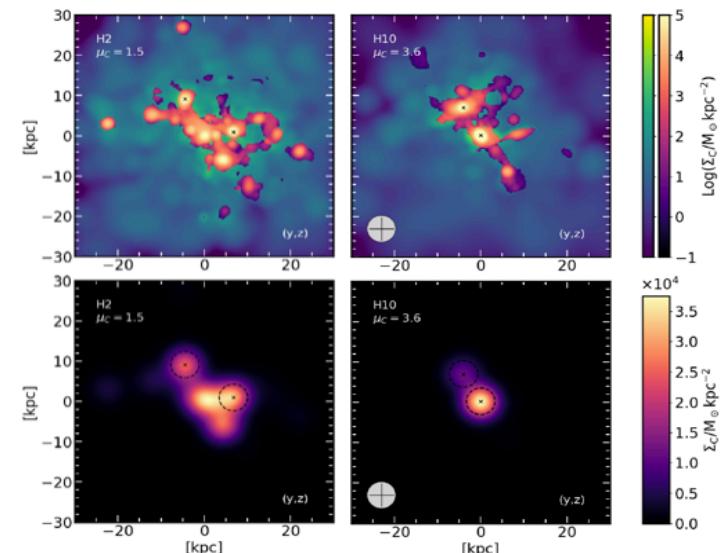
velocity integrated [CII] maps



[CII] flux density

COSMOLOGICAL SIMULATIONS performed with dustyGadget

8 major merging synthetic galaxies



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MAIN CONCLUSION

- Metal enriched envelopes can be attributed to *dynamical interaction* between merging galaxies and *star-forming satellites* (dustyGadget simulations)

Connecting stellar & galactic scales

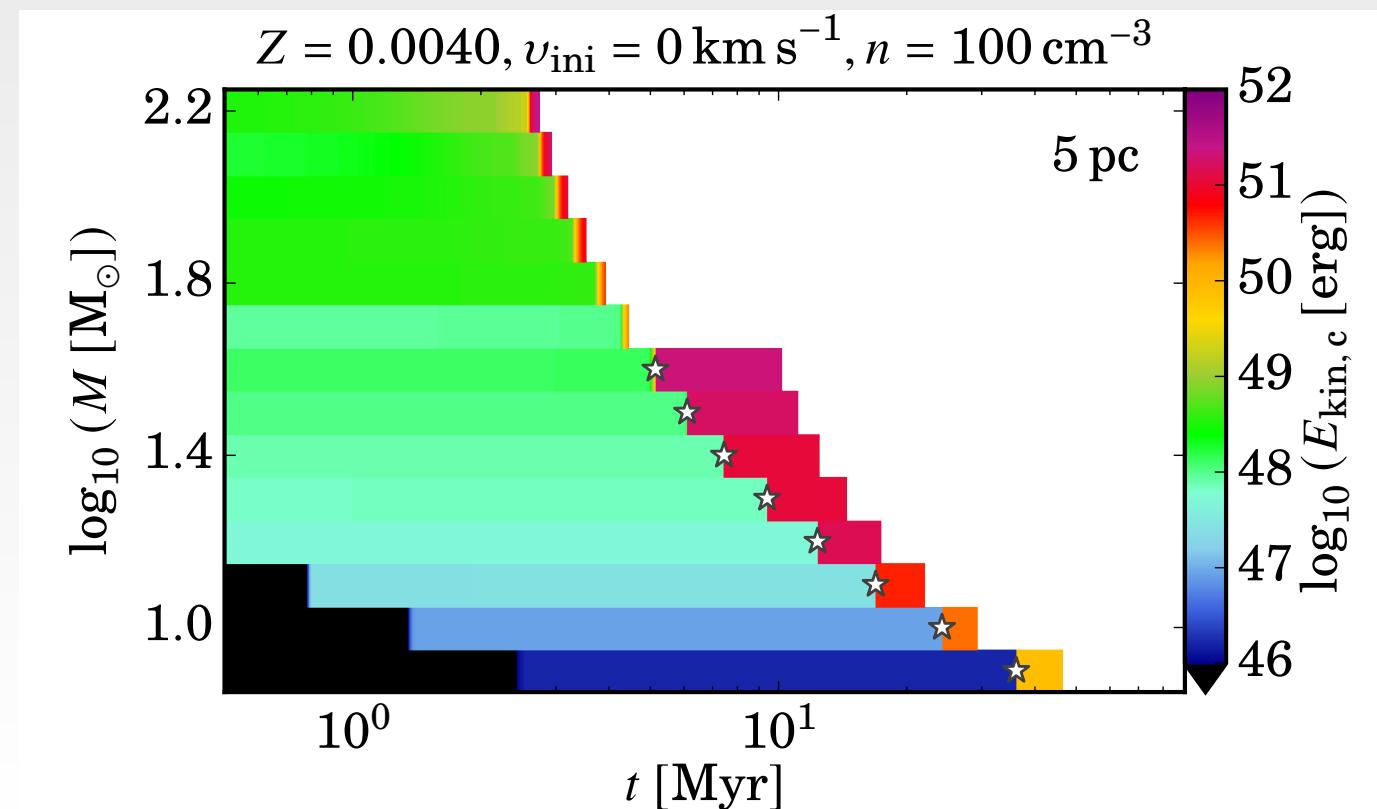
Energetic feedback from stellar wind bubbles to SN remnants

Goal: Improve sub-grid stellar-feedback models accounting for winds, photoionisation and supernova

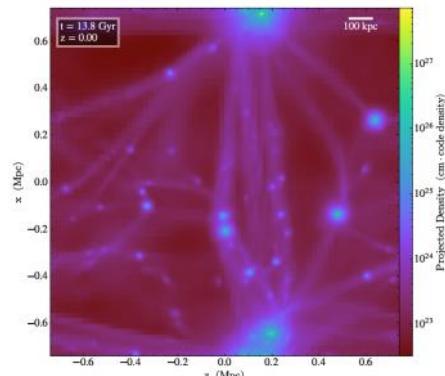
Method: Large suite of high-res 1D simulations to assess the energy that reaches different radii

Fichtner et al., subm. to A&A

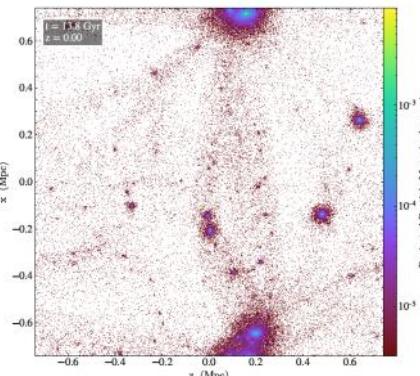
Results: Meet me at the poster



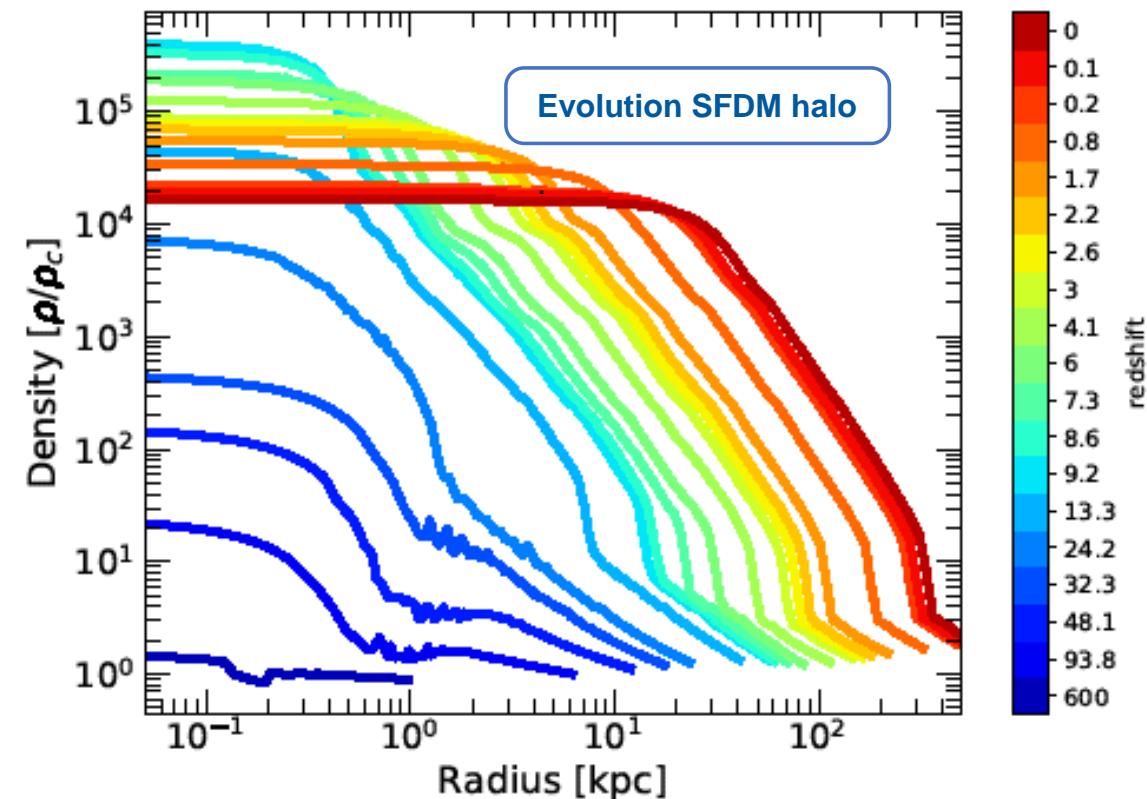
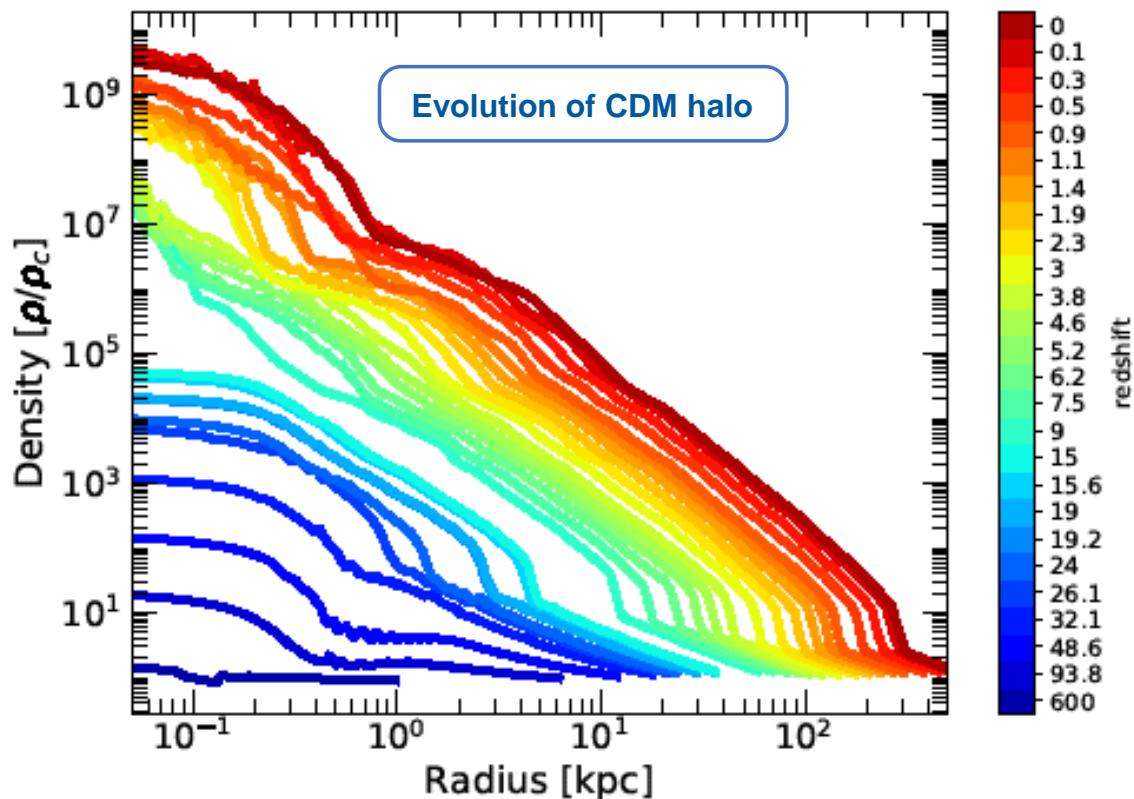
Fluid approximation



vs



N-Body simulation

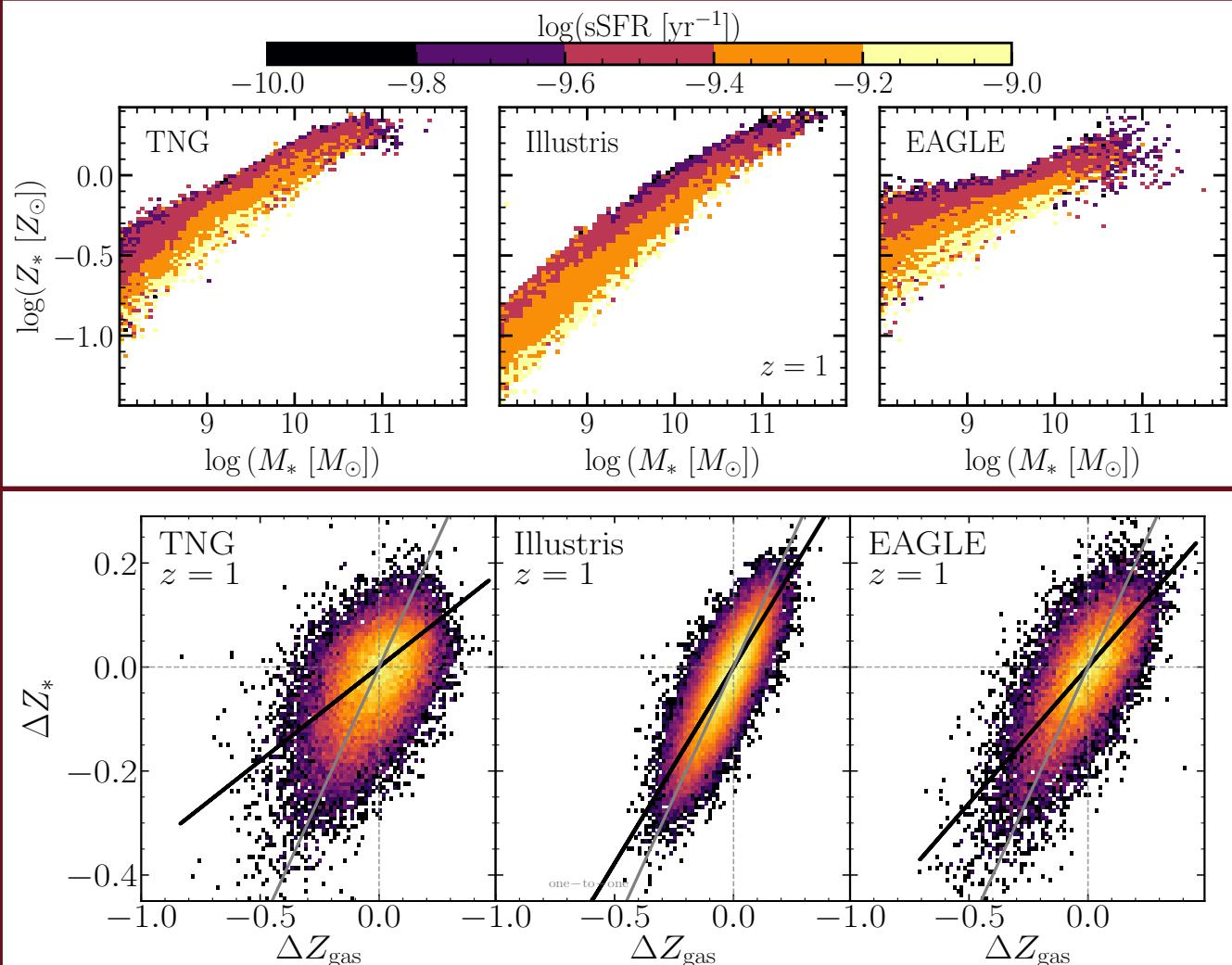


USING THE METAL CONTENT OF GALAXIES TO INFORM STELLAR FEEDBACK MODELING

ALEX M. GARCIA¹, PAUL TORREY¹, ET AL. ¹UNIVERSITY OF VIRGINIA

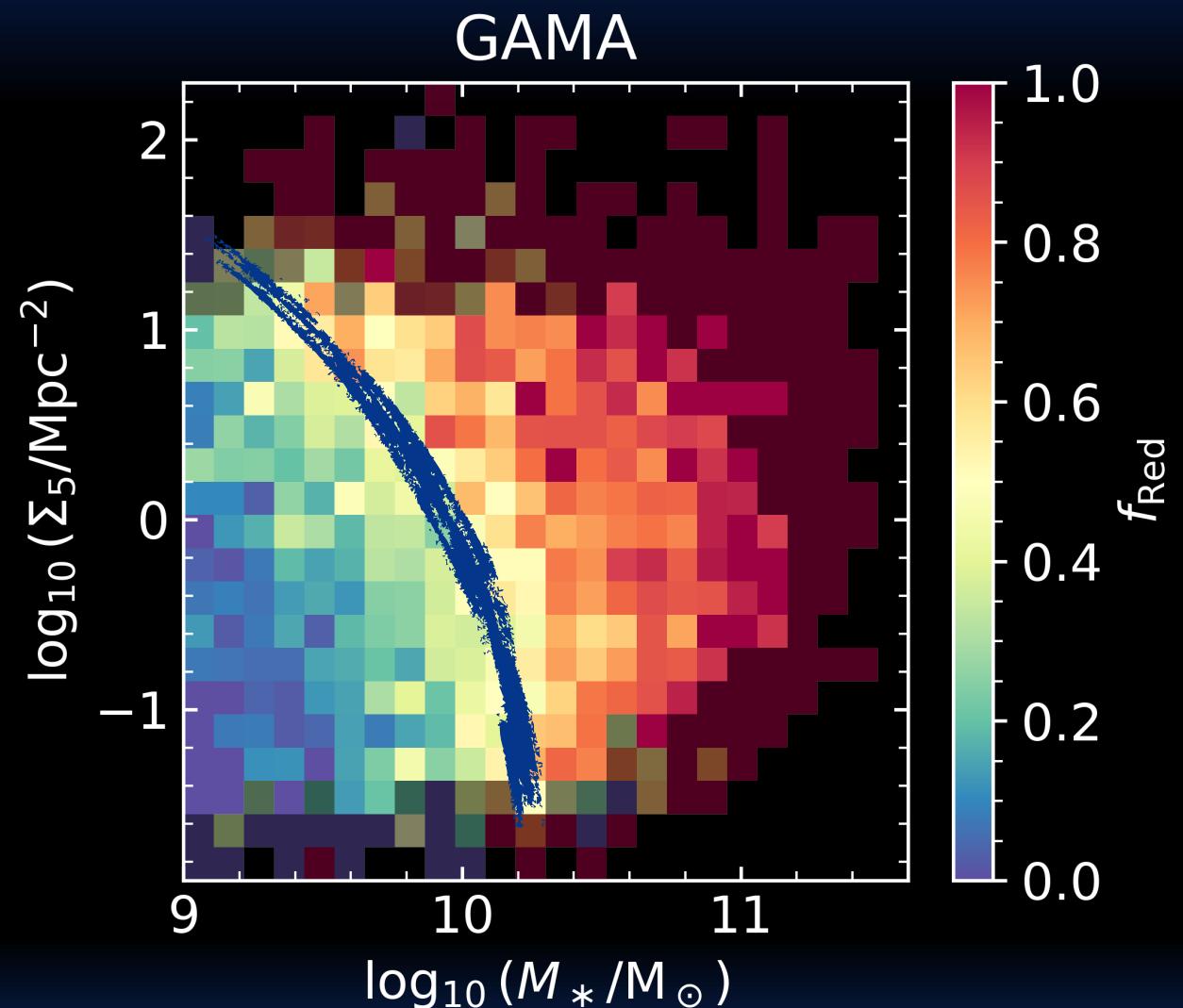
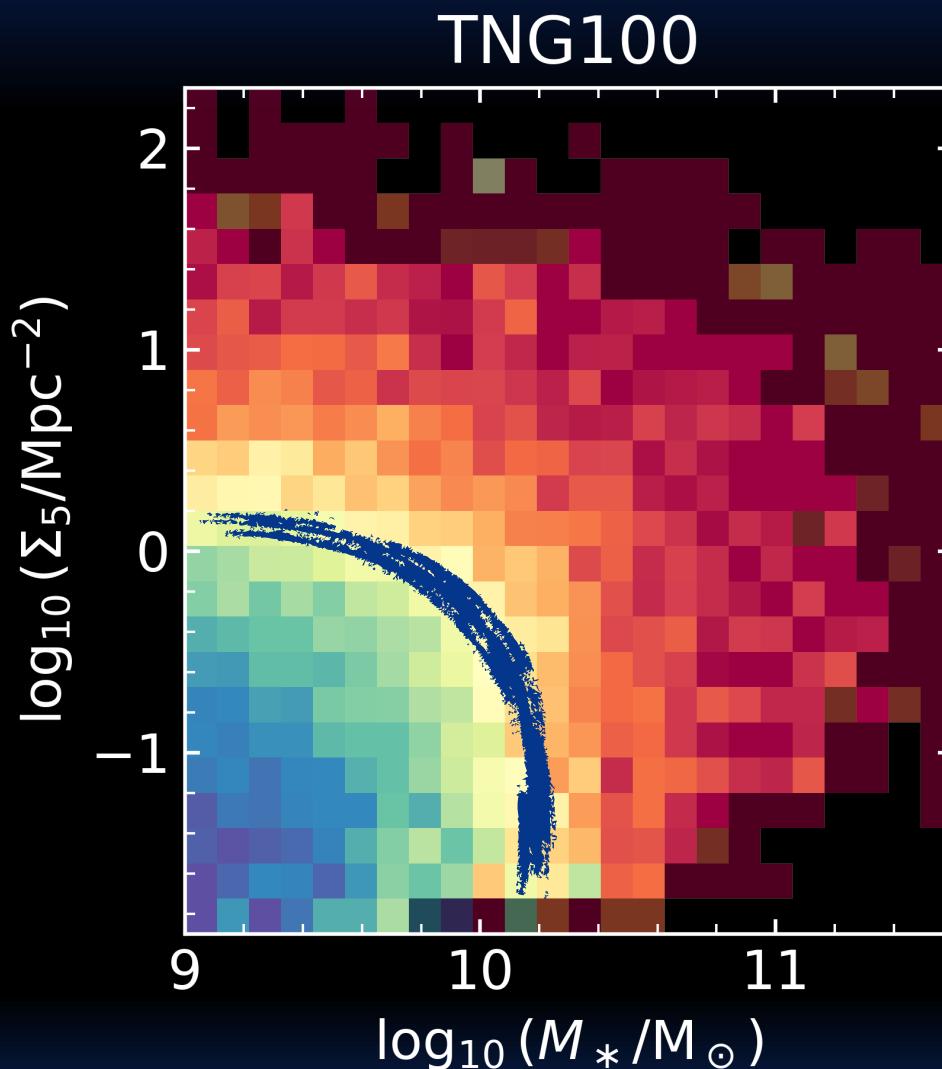
KEY RESULTS

- THE SCATTER ABOUT THE STELLAR MZR CORRELATES WITH SSFR, SIMILAR TO GAS MZR
- THE OFFSETS FROM THE STELLAR AND GAS-PHASE MZRs ARE CORRELATED
- WE BUILD A TOY MODEL THAT DESCRIBES THE CORRELATION BETWEEN THESE TWO METALLICITIES
- THIS MODEL LIKELY DEPENDS ON THE FEEDBACK EMPLOYED IN THESE THREE SIMULATIONS – MORE BURSTY FEEDBACK WOULD CURTAIL STAR'S ABILITY TO “CATCH-UP” TO THE GAS-PHASE



The colours of the TNG100 simulation

Andrea Gebek et al.





Cosmological hydrodynamical simulations of **isolated dwarf** galaxies.

Track the evolution of **stars, gas and dark matter** within a **LCDM** cosmology for the entire Hubble time (redshift 99 \rightarrow 0).

Built on the grid-based AMR codebase – **RAMSES**

3pc
 $M_{\text{DM}} = 945 M_{\odot}$
 $M_* = 300 M_{\odot}$
 $M_{\text{gas}} = 161 M_{\odot}$

The Emergence of Nuclear Star Clusters

Formation Mechanism

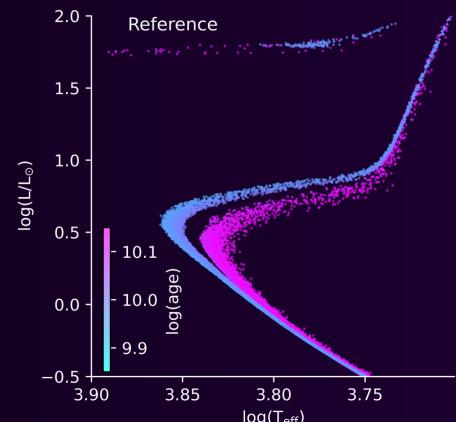
$$M_{\text{tot}} \sim 5 \times 10^9 M_{\odot}$$

$$M_* \sim 10^6 M_{\odot}$$

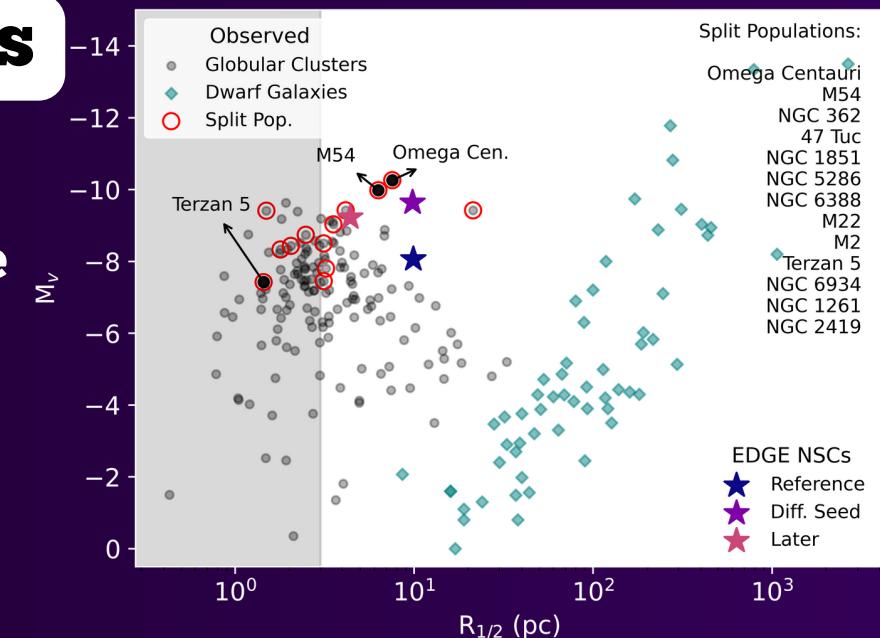


Observational Properties

Two stellar populations separated in age



Could GCs with multiple stellar populations be stripped NSCs?



Cosmological Simulations with Meshless Finite Mass

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Implementation of MFM in OpenGadget3

Comparison with other hydro-methods

Advantages:

- Development of mixing instabilities
- Subsonic turbulence
- More turbulence detected in galaxy clusters

