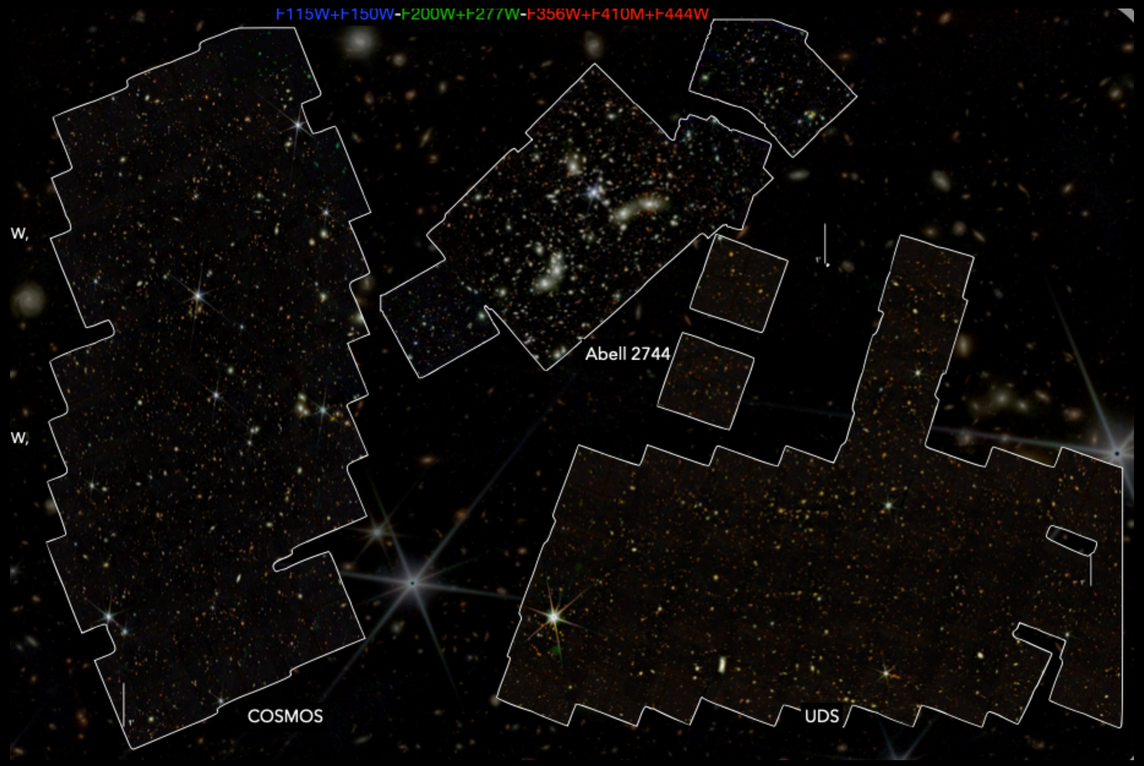
Low-Mass Quiescent Galaxy Sizes in JWST PRIMER and UNCOVER

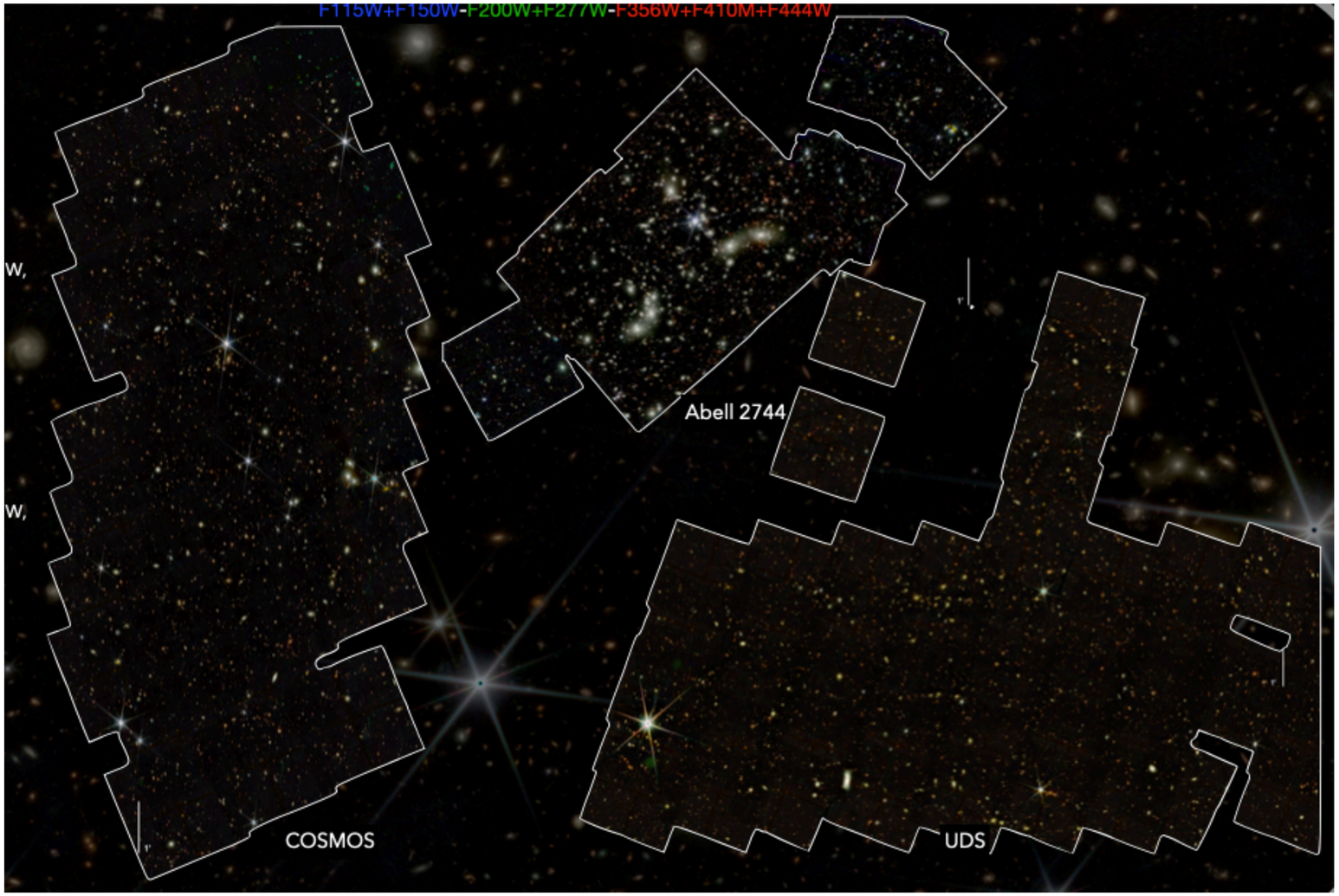
Revealing Two Distinct Quiescent Galaxy Populations at Cosmic Noon



Sam Cutler, Kate Whitaker (UMass Amherst)
The PRIMER and UNCOVER Teams
@secutler

Low-Mass Quiescent Galaxy Sizes with JWST

The UNCOVER and PRIMER Treasury Surveys



PRIMER (JWST-GO-1837):

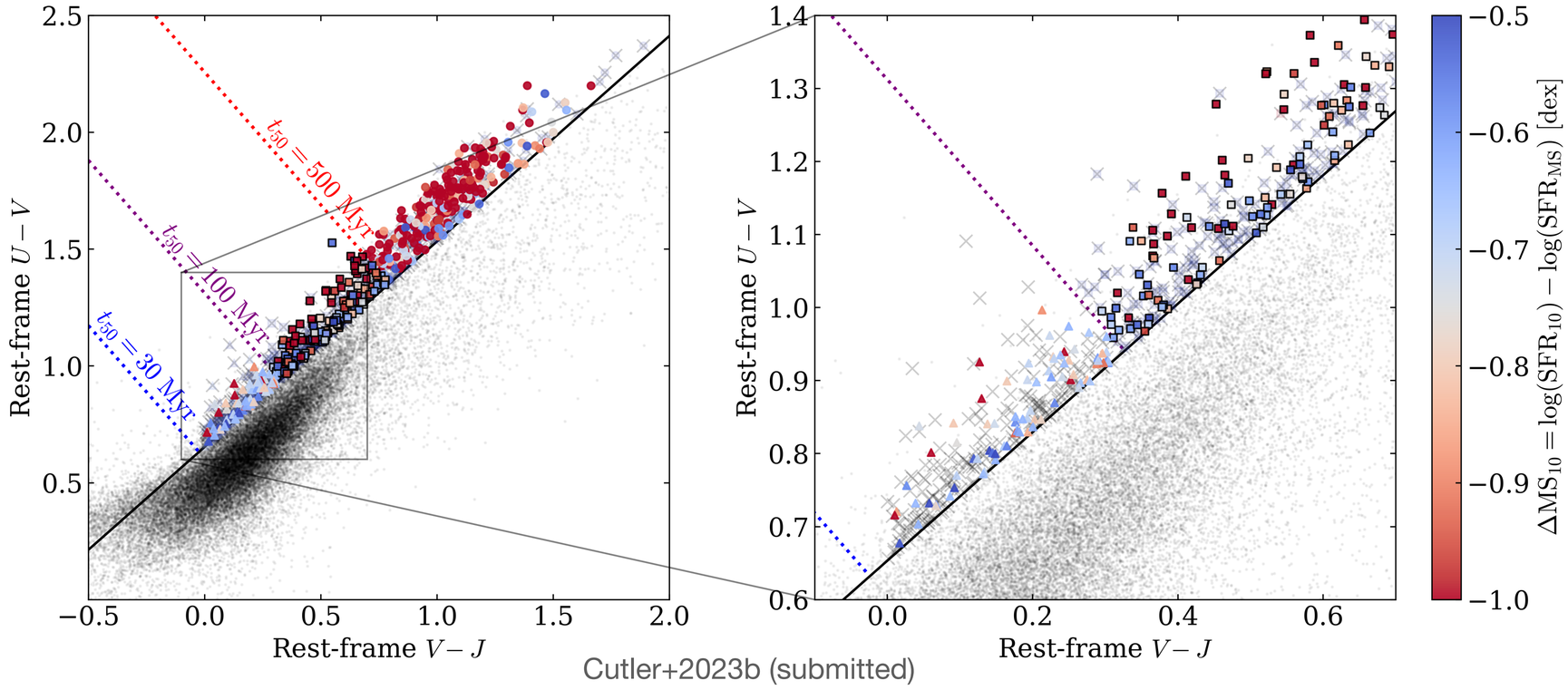
- Covers two legacy fields (COSMOS and UDS)
- Homogeneous depth (~28 ABmag in F200W)
- 378 sq. arcmin. total
- Observations in F090W, F115W, F150W, F200W, F277W, F356W, F410M, and F444W
- Archival HST data

UNCOVER (JWST-GO-2561):

- Targets the Abell-2744 lensing cluster
- Deepest-to-date publicly available survey (>29 ABmag in F200W without corrections for lensing)
- 45 sq. arcmin. total
- Observations in F090W, F115W, F150W, F200W, F277W, F356W, F410M, and F444W
- Archival HST data

Low-Mass Quiescent Galaxy Sizes with JWST

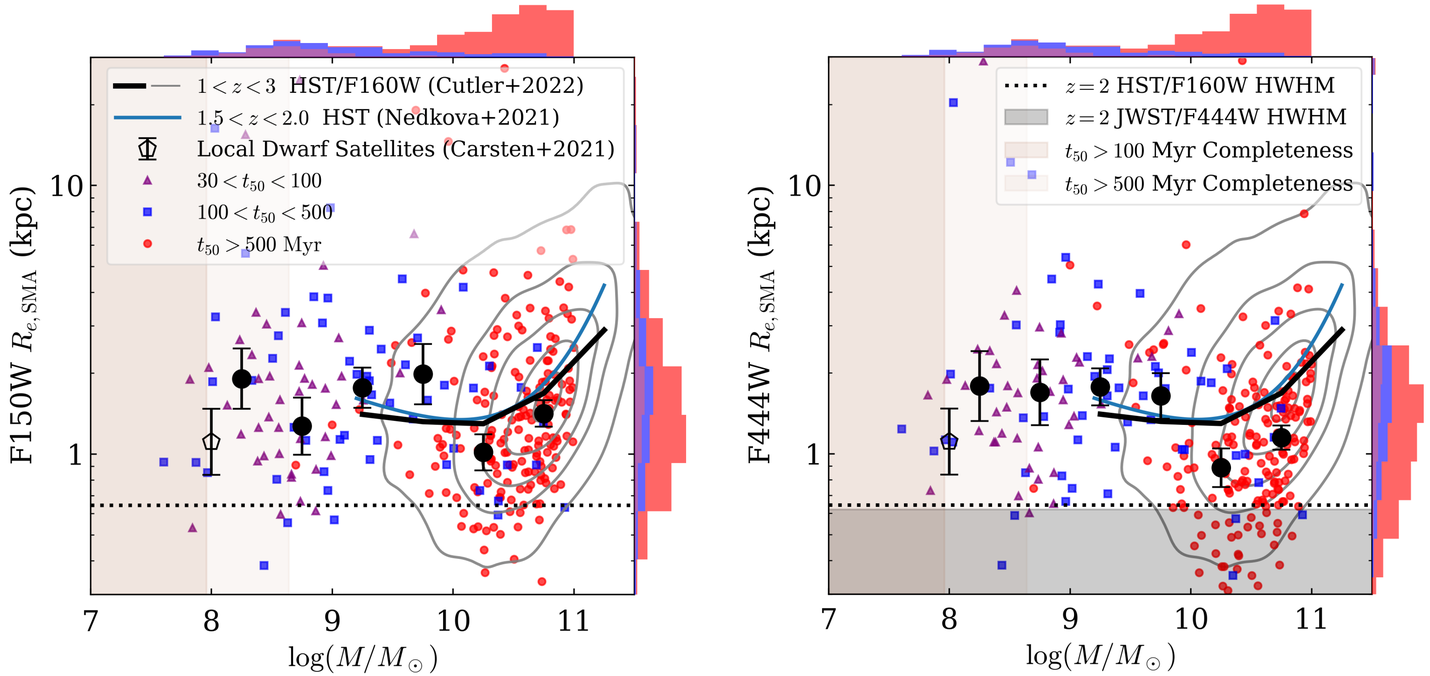
Sample selection: extended UVJ + sSFR criteria



Cutler+2023b (submitted)

Low-Mass Quiescent Galaxy Sizes with JWST

The size-mass relation at cosmic noon



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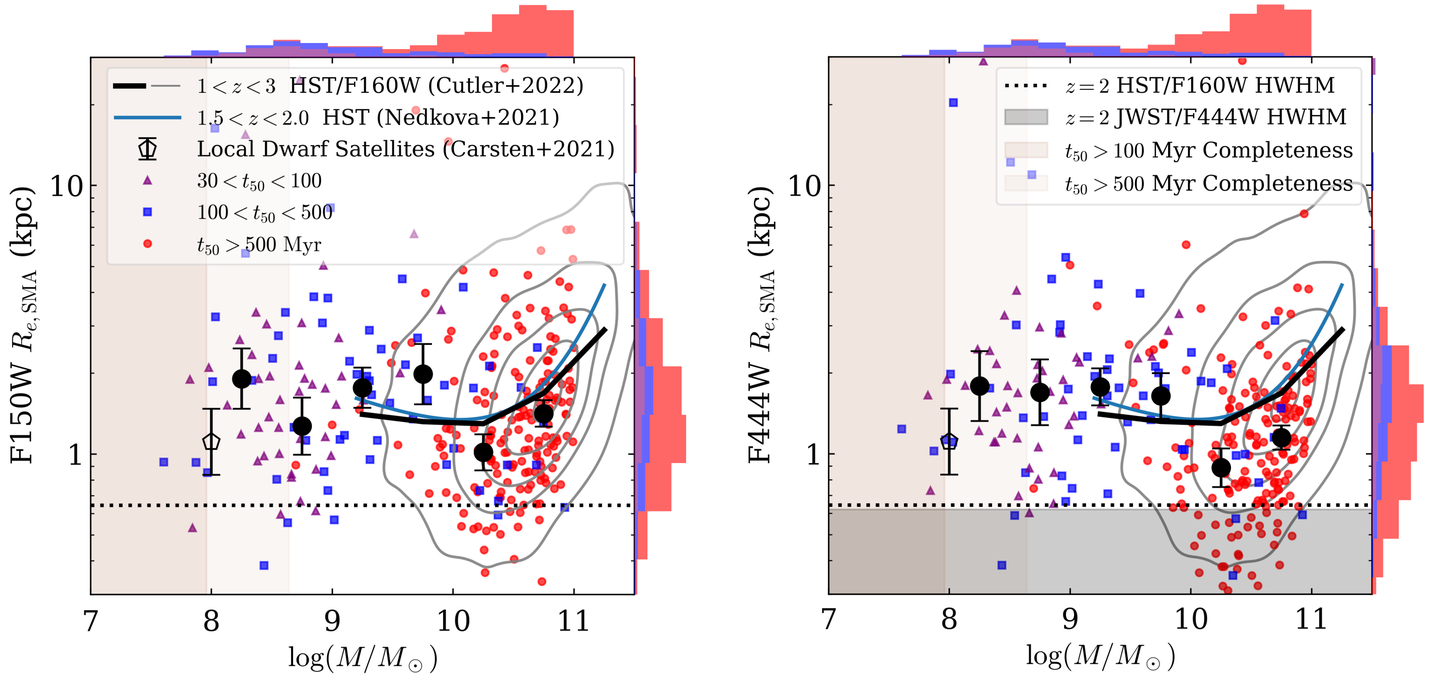

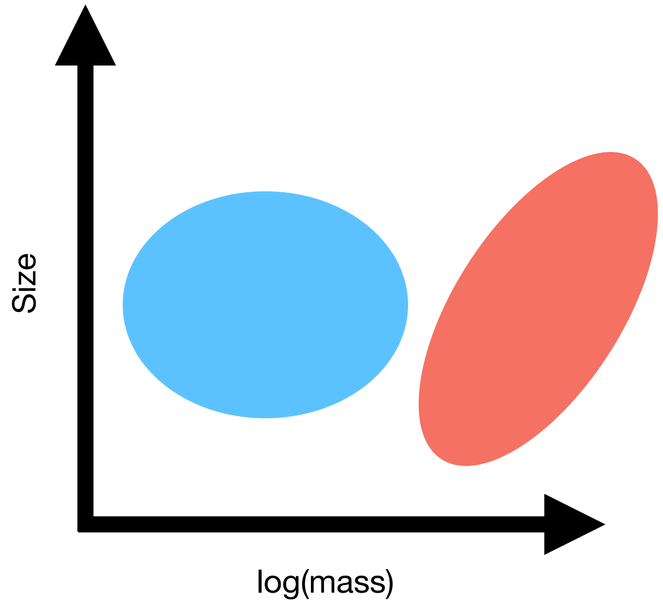

Cutler+2023b (submitted)

Low-mass quiescent galaxies are a distinct population

Low-Mass Quiescent Galaxy Sizes with JWST

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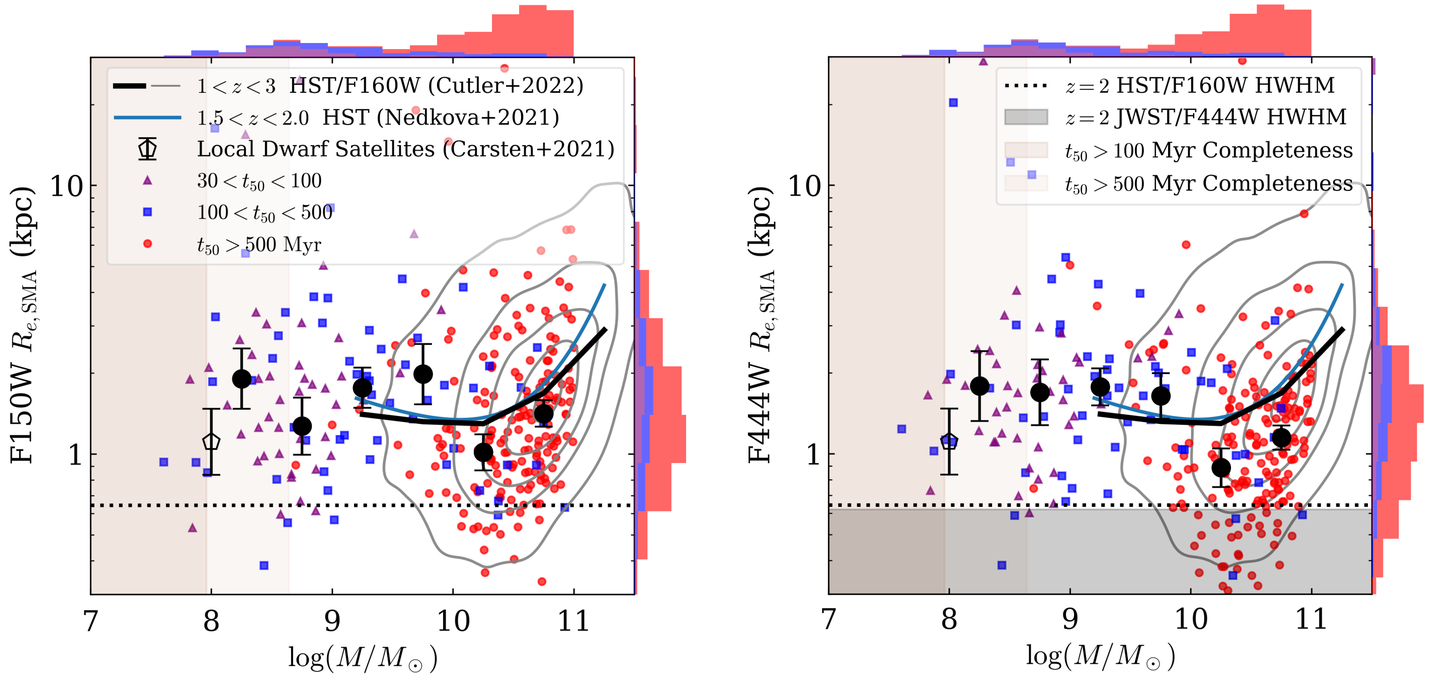
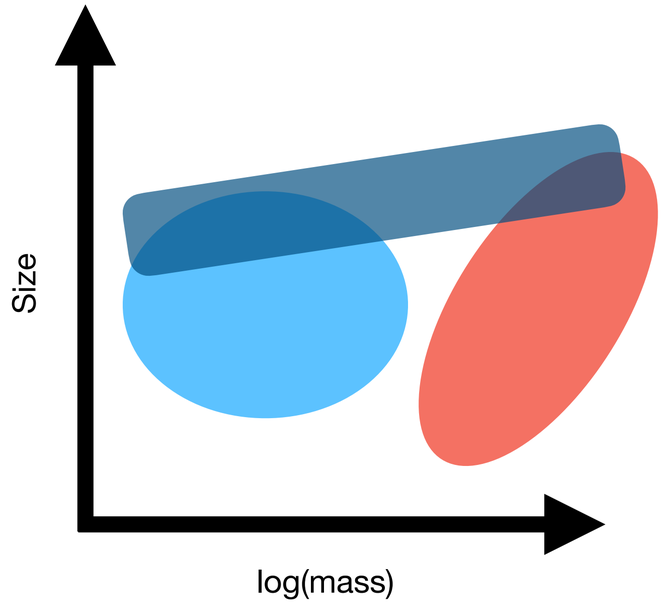


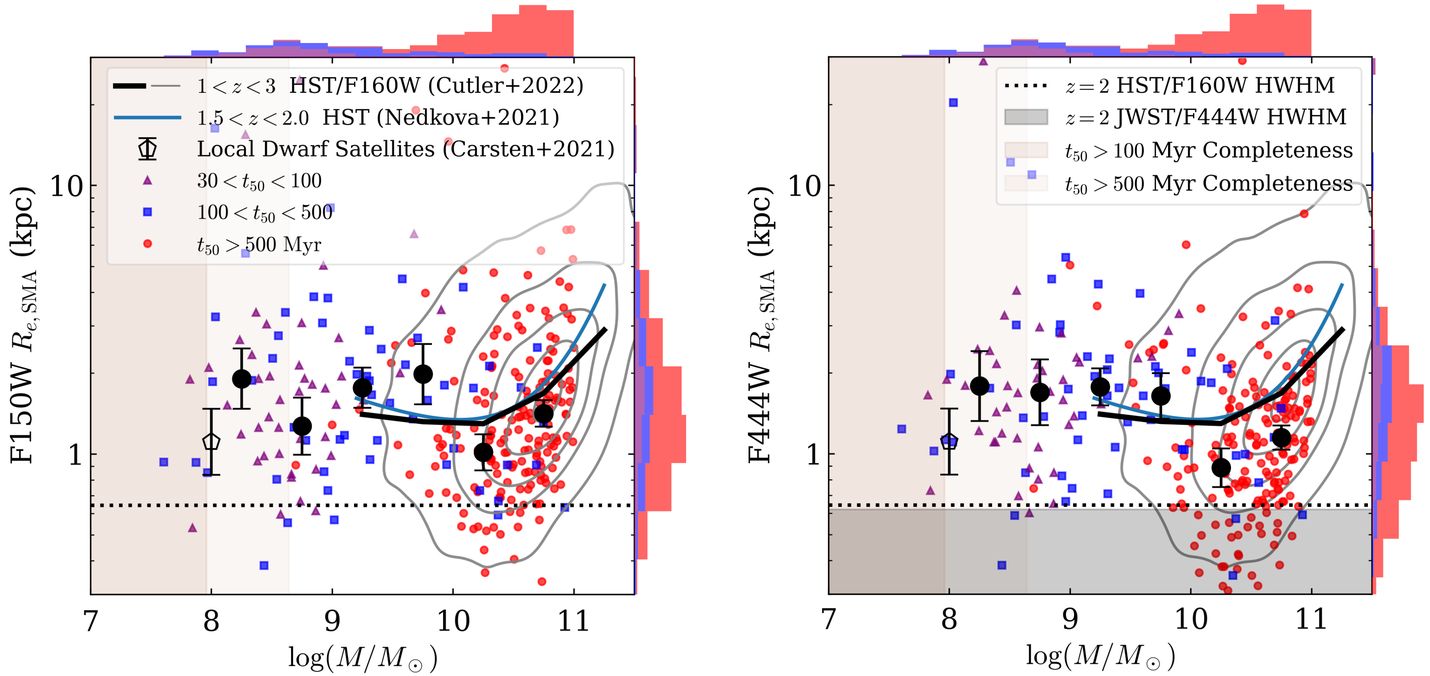


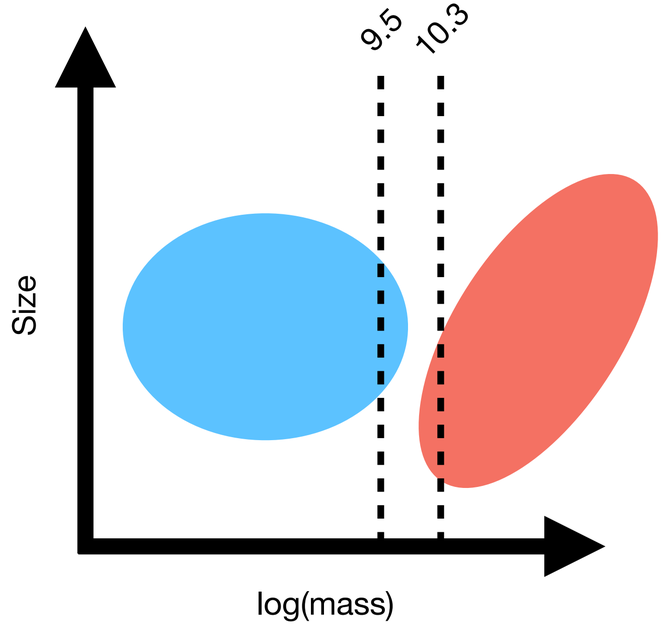
Cutler+2023b (submitted)

Low-mass quiescent galaxies are a distinct population similar to star forming galaxies

Low-Mass Quiescent Galaxy Sizes with JWST

The size-mass relation at cosmic noon





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Low-mass quiescent galaxies are a distinct population similar to star forming galaxies

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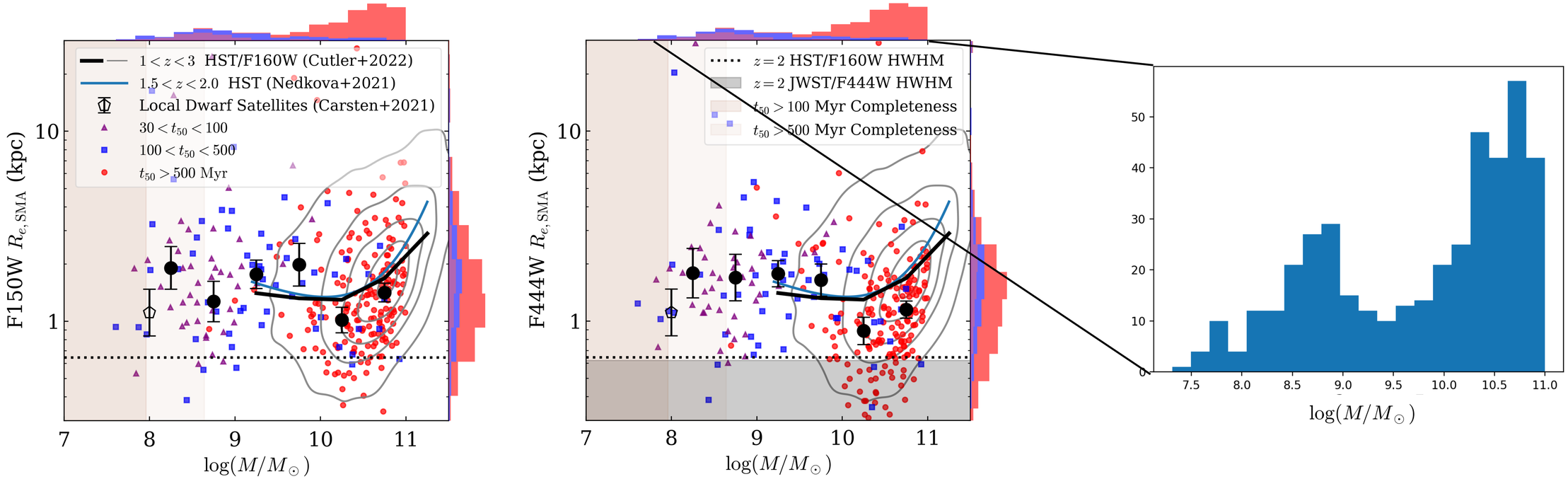
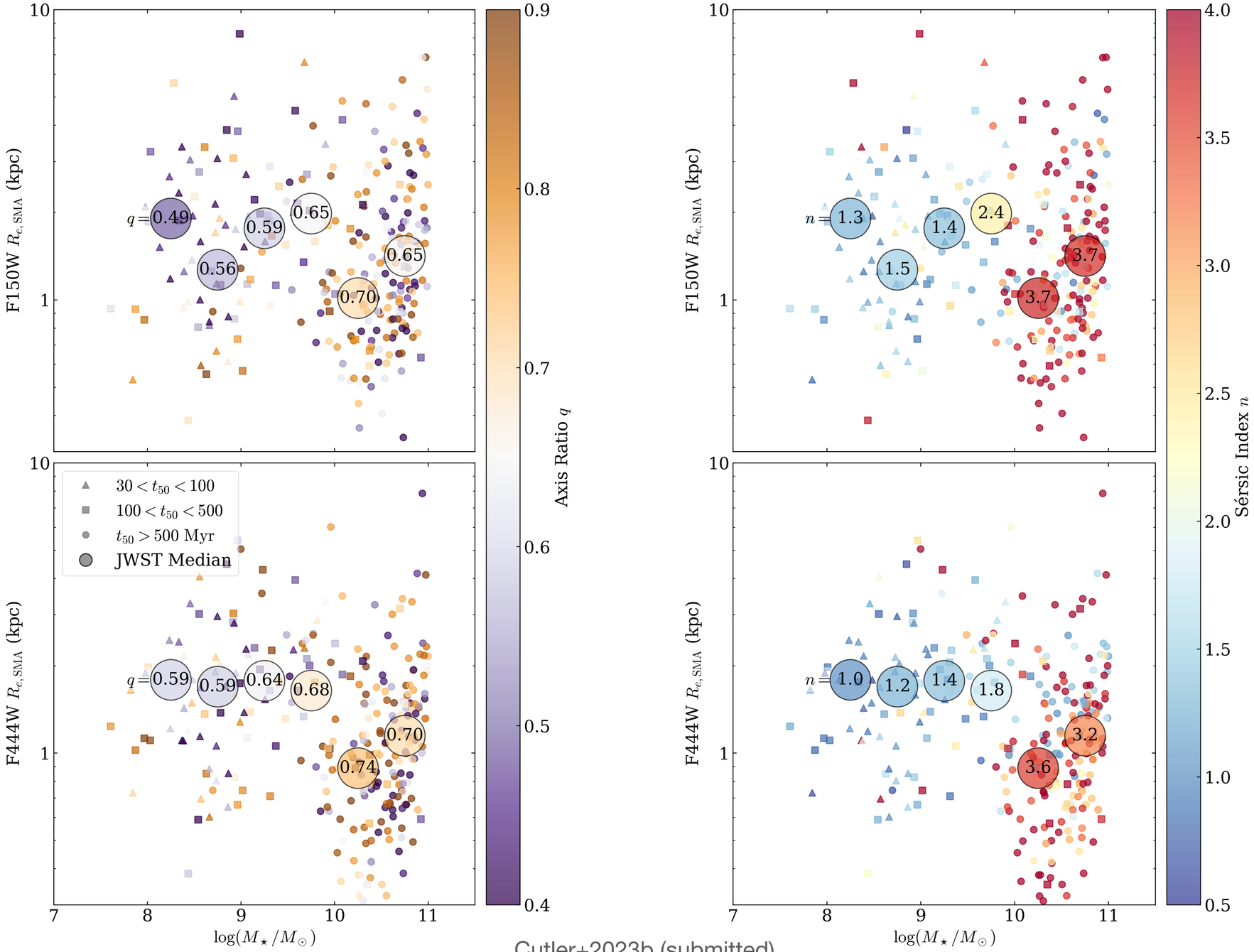


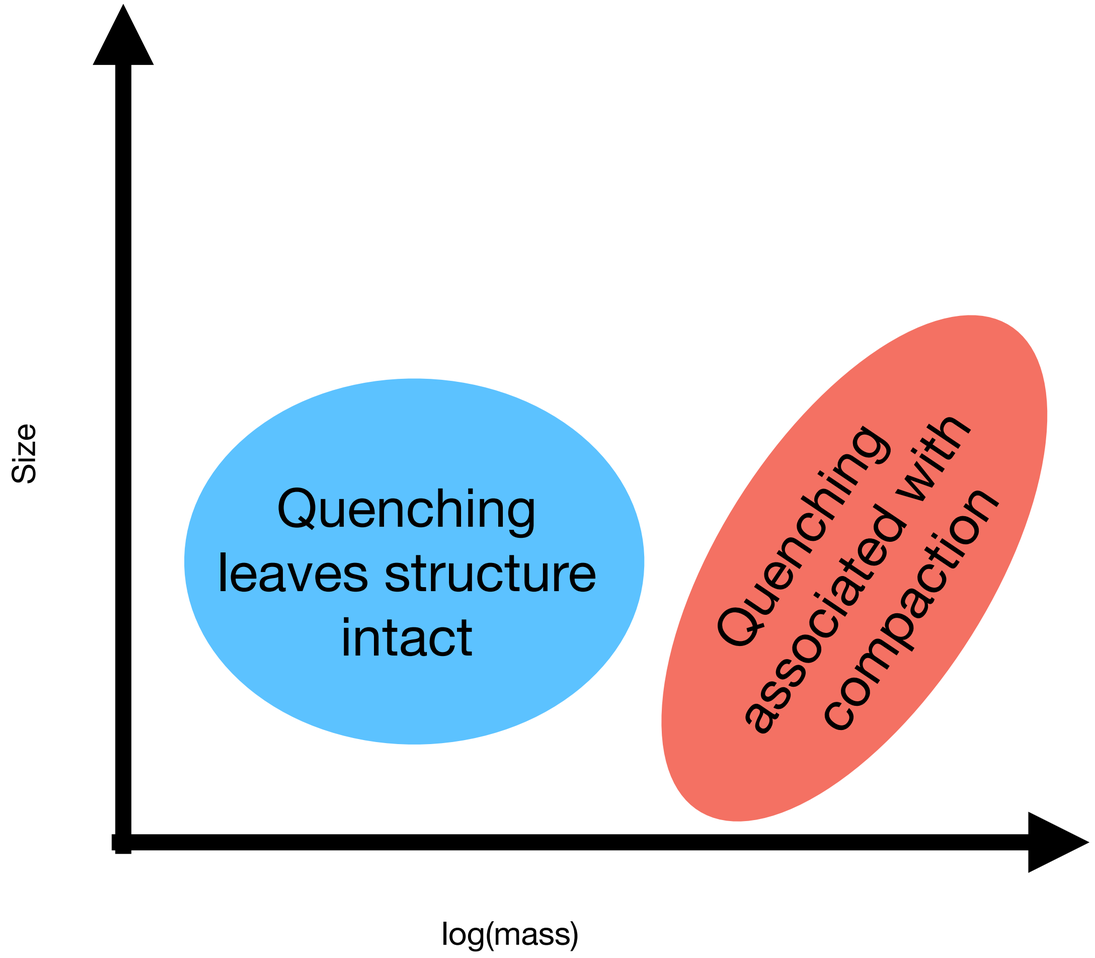
Cutler+2023b (submitted)

Also apparent in stellar mass distribution

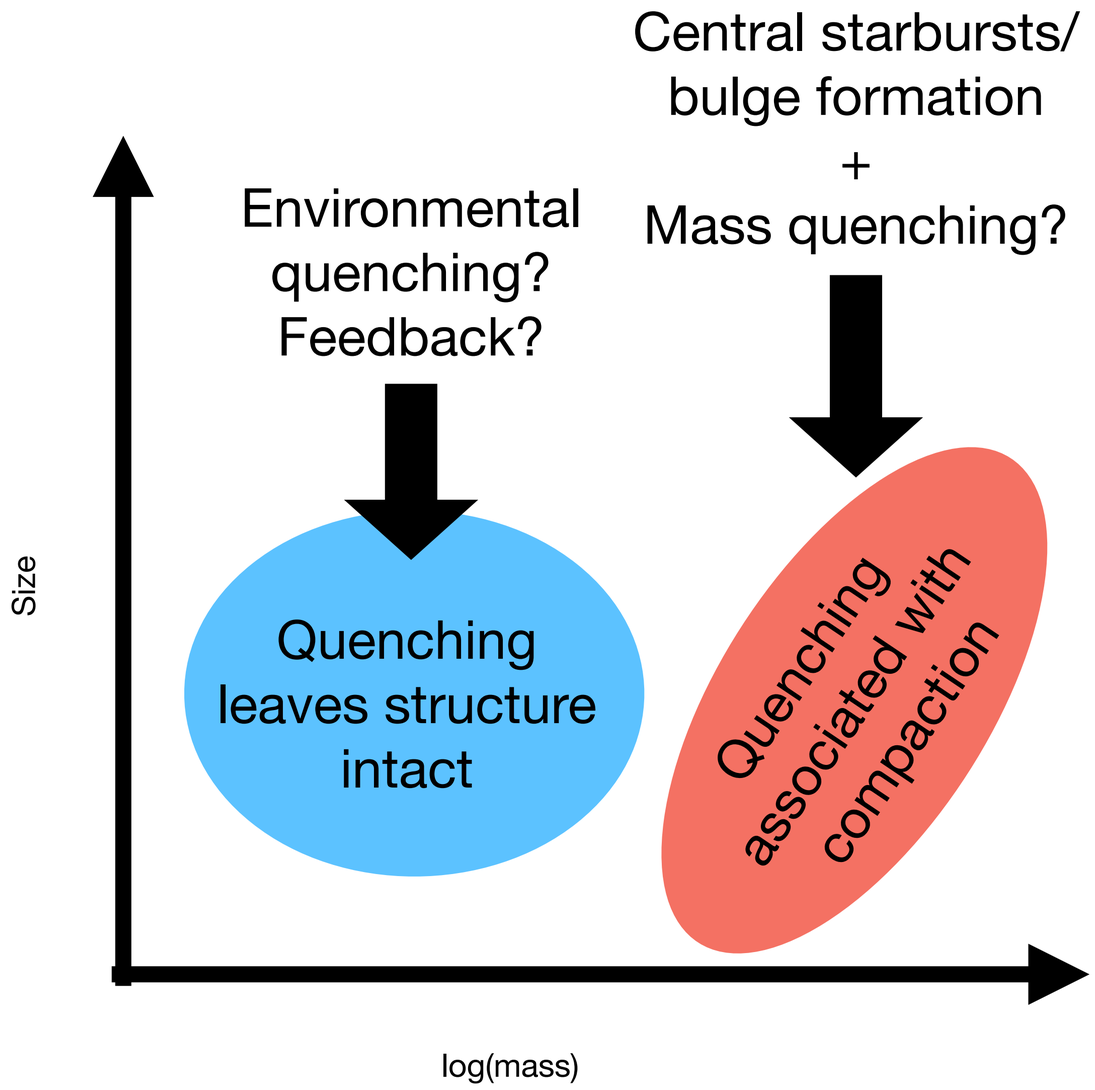


Cutler+2023b (submitted)

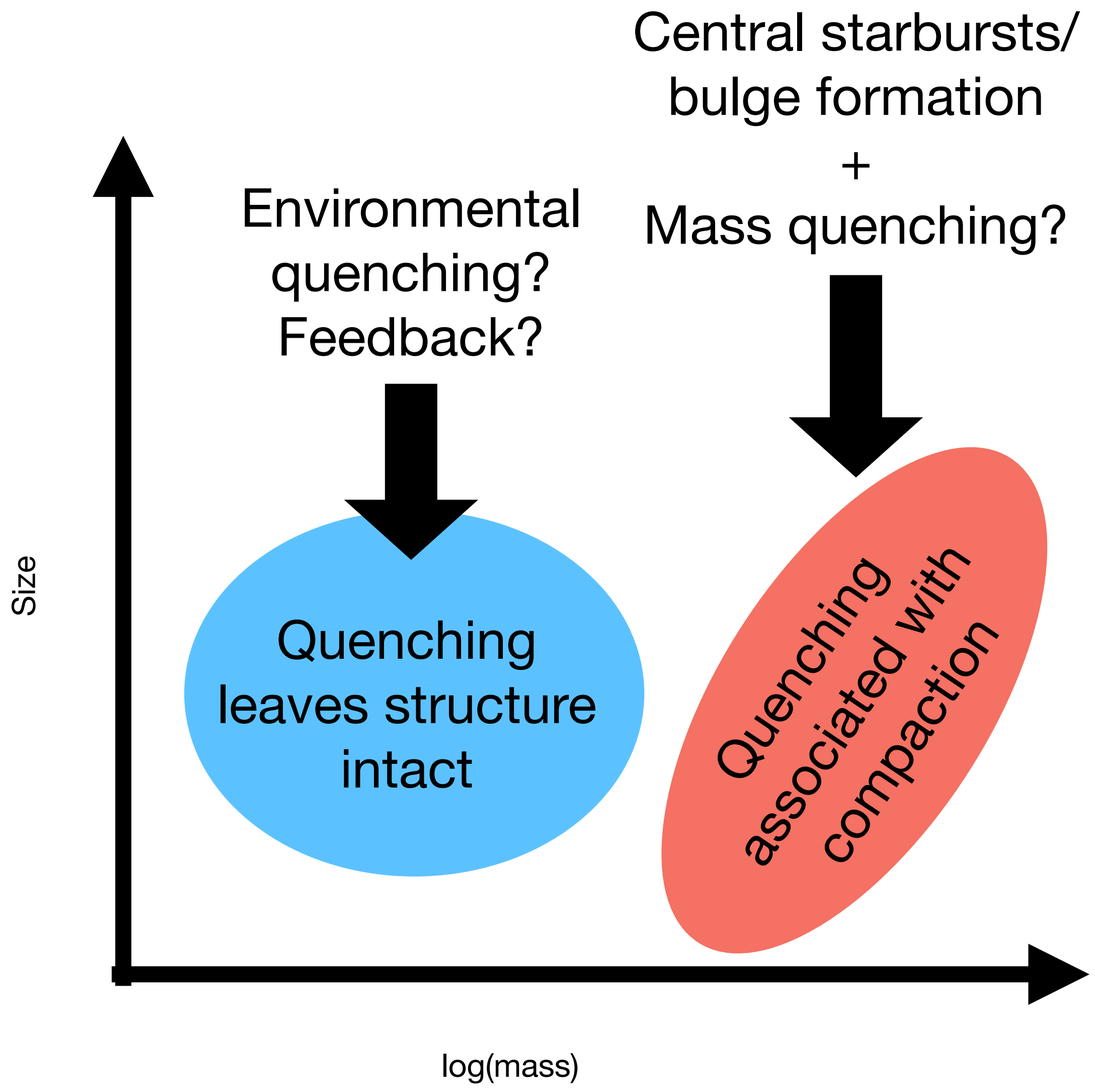
Galaxy Evolution at Low Mass

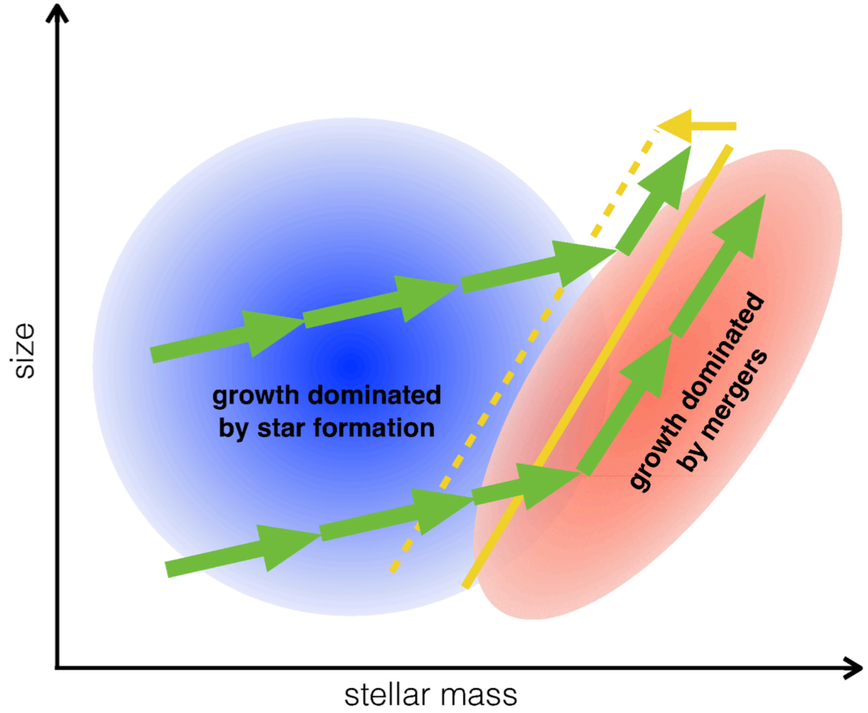


Galaxy Evolution at Low Mass



Galaxy Evolution at Low Mass

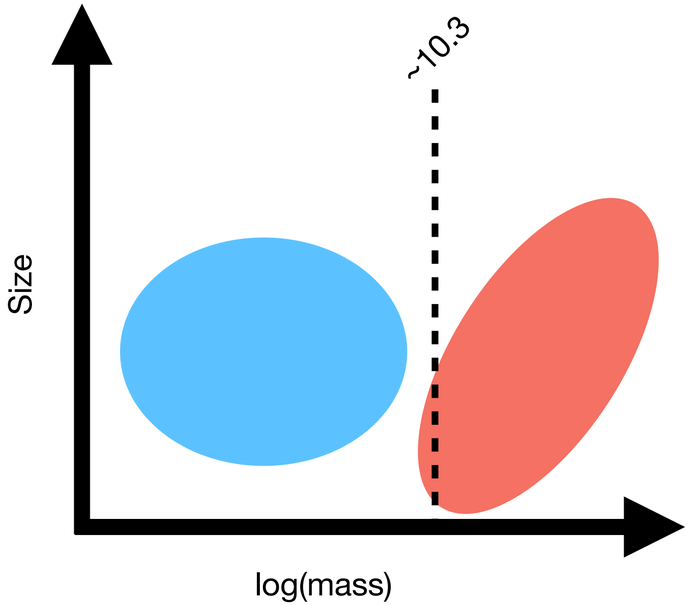


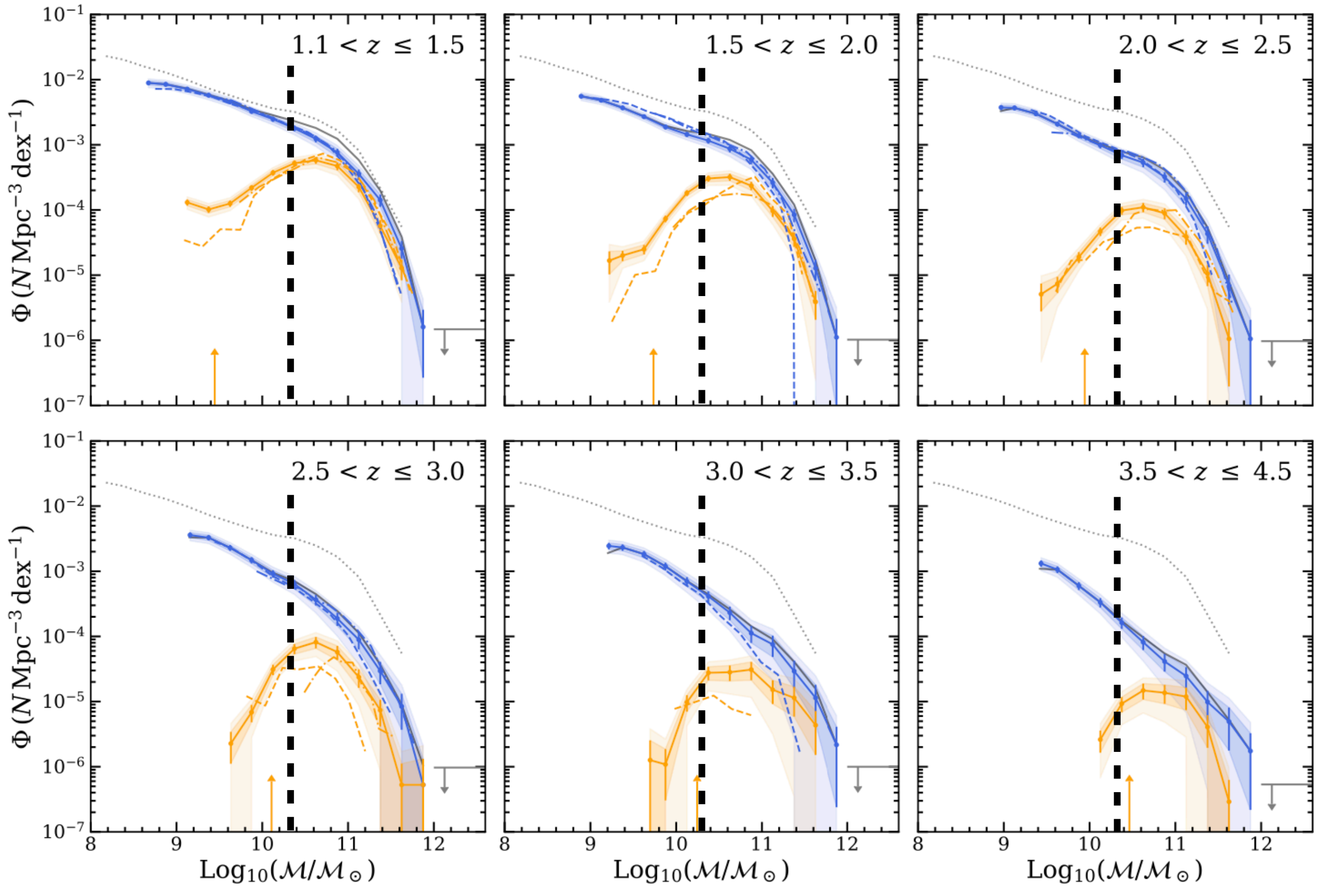


van Dokkum+2015

Galaxy Evolution at Low Mass

Corresponds with peak in quiescent galaxy mass function

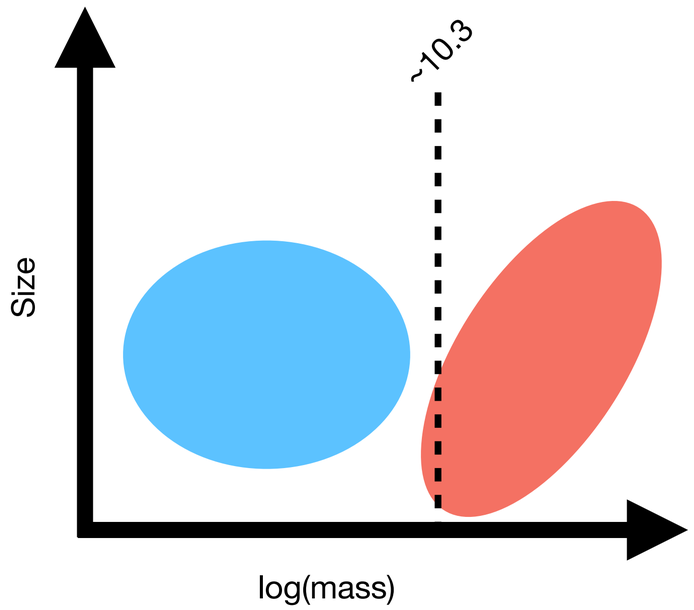


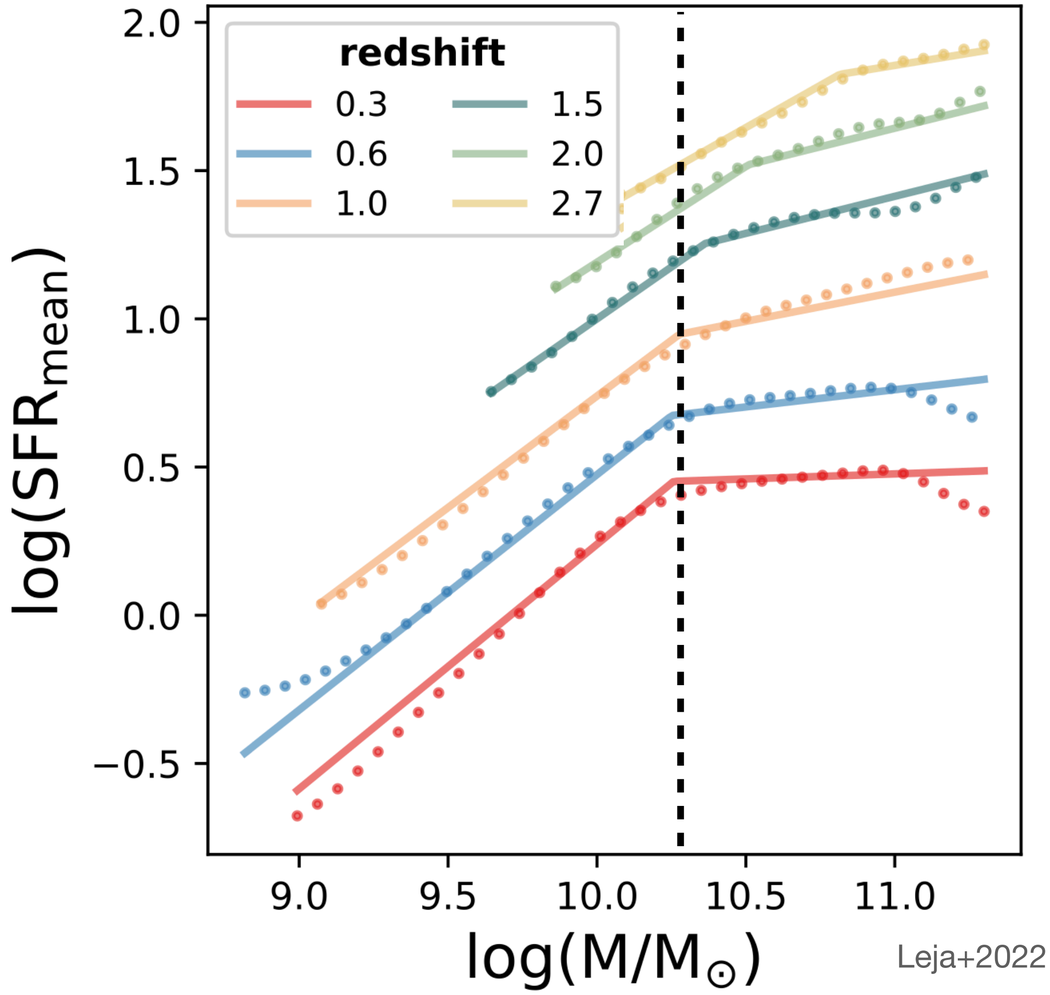


Weaver+2023

Galaxy Evolution at Low Mass

Corresponds with change in SFMS slope

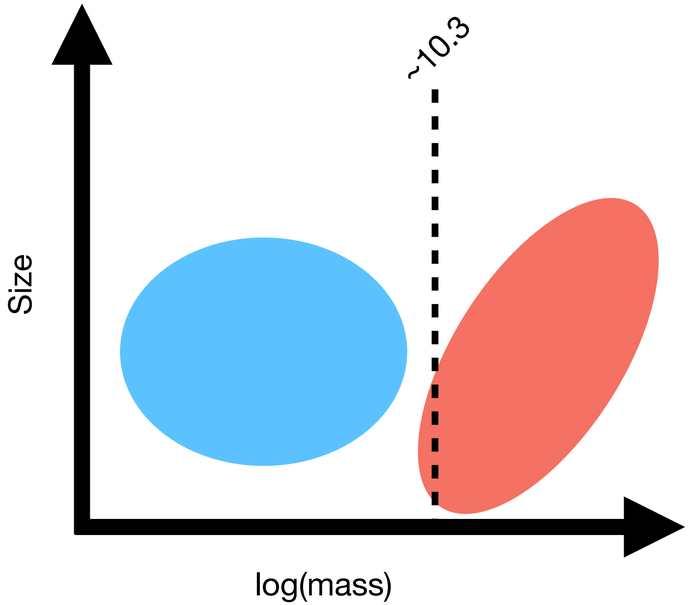


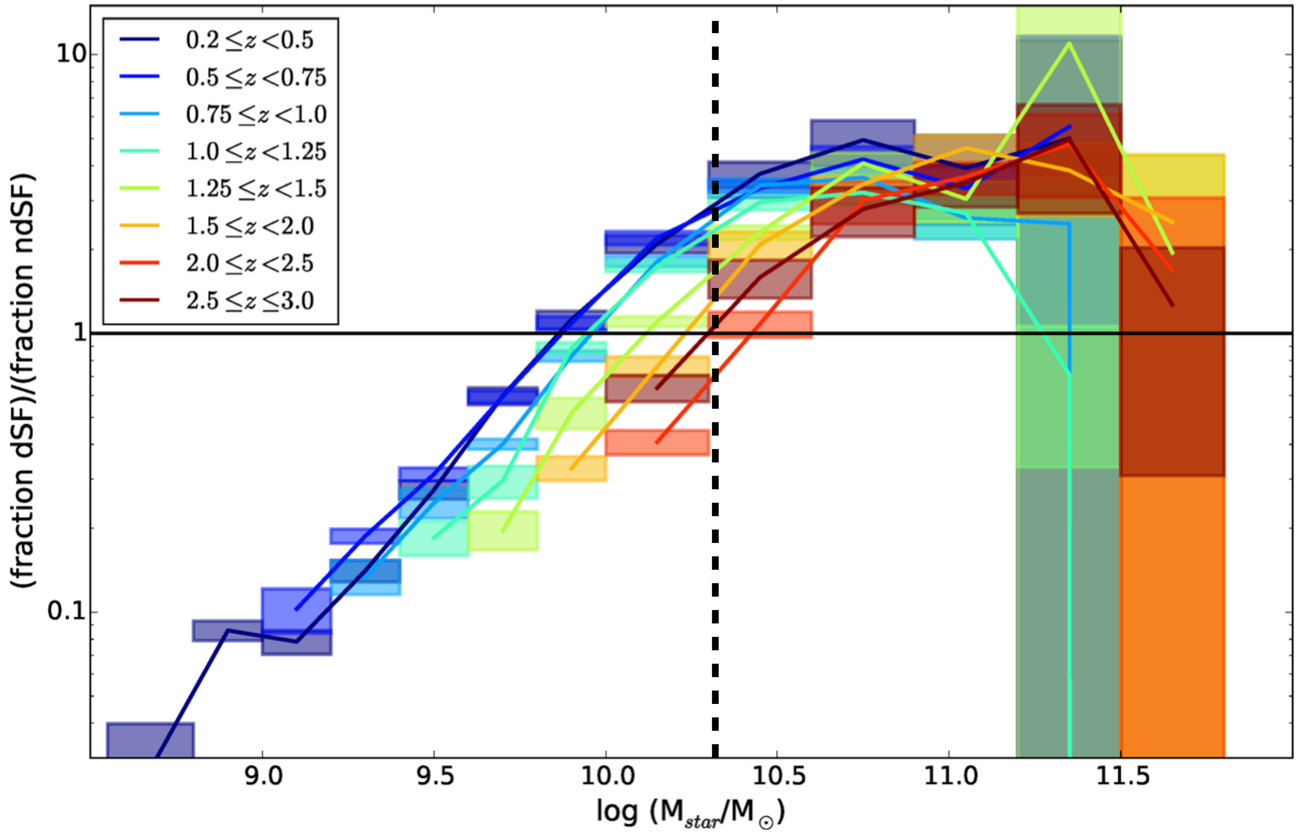


Leja+2022

Galaxy Evolution at Low Mass

Corresponds with transition to predominantly dusty SFGs





Martis+2016

Quiescent galaxies at cosmic noon fall into two classes:

1. Young*, low-mass, and disk-like
2. Old, massive, and spheroidal

The separation between these populations occurs at logM~10.3

- ➡ This coincides with several significant transitions in galaxy evolution
- ➡ Galaxy evolution is dramatically different at low masses

Cutler et al. 2023b (Submitted, arXiv:2312.15012)

Contact me with any thoughts or suggestions!
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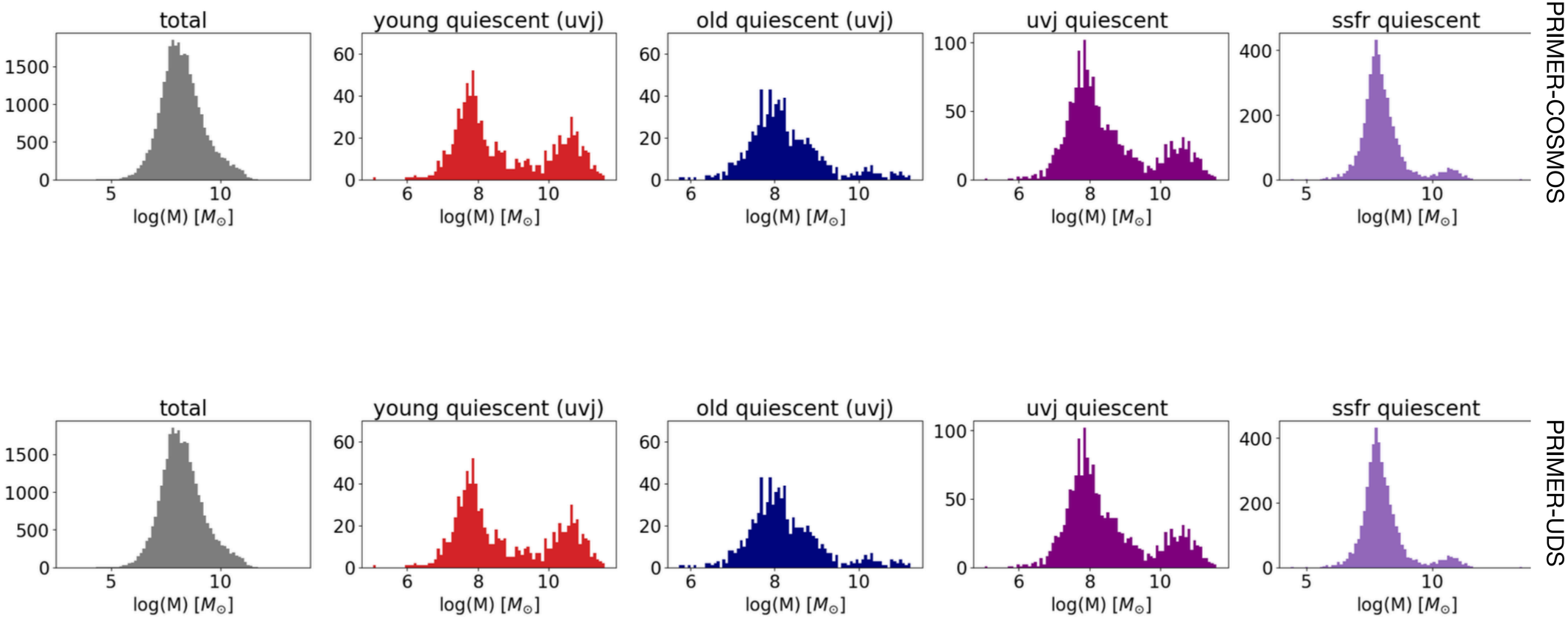
total
young quiescent (uvj)
old quiescent (uvj)
uvj quiescent
ssfr quiescent
log(M) [$M_\odot$]
PRIMER-COSMOS
PRIMER-UDS