Post-starburst galaxies: recently quenched galaxies, very rare in the local universe, dominated by A-type spectra

Post-starburst galaxies appear to be smaller than both star-forming and quiescent galaxies at similar masses and redshifts (Whitaker+ 2012, Yano+ 2016)

These are half light sizes—will same trend show in half mass sizes?

Possible mechanisms that can form compact quiescent galaxies: compaction, dissipational collapse

Post-starbursts just quenched, so they are the ideal probe to test these scenarios

Galaxies from the Newfirm Medium Band Survey (NMBS; Whitaker+ 2011)
• Selection based on spectral shape (Kriek+ 2011)
CANDELS (Grogin+ 2011) data and 3D-HST (Brammer+ 2012; Skelton+ 2012) PSF-matched images let us measure photometry in annuli

Select post-starburst galaxies from ZFOURGE (Straitman+ in prep; zfourge.tamu.edu)
• Deeper, covers COSMOS, CDFS, and UDS– more sky coverage means more post-starbursts to investigate, more galaxies in stack
• Investigate mass-to-light gradients as a function of UVJ color

How well annuli SEDs fit resolved photometry

$\chi^2 = \sum_{i,j=1}^{N_{\text{annuli}}} \left( \frac{F_{i,j} - \sum_{i,j} N_{\text{annuli}} M_{i,j}}{\sigma_{i,j}} \right)^2$

Measured flux in integrated filter

Sum of models at $\lambda_i$ of integrated filter

Iteratively adjust (age, $\tau$, $A_v$) of each annulus’ model SED until $\chi^2_{\text{tot}}$ is minimized and we have best-fit model SED, mass, age, $\tau$, and $A_v$ for each annulus (method similar to Wuyts+ 2012)

Mass-to-light ratio decreases with $r_e$

Stack of 11 post-starburst galaxies

post-starburst galaxies may be even smaller than their half-light radii imply!

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• Deeper, covers COSMOS, CDFS, and UDS– more sky coverage means more post-starbursts to investigate, more galaxies in stack
• Investigate mass-to-light gradients as a function of UVJ color
• How does M/L vary along the red sequence?

References