

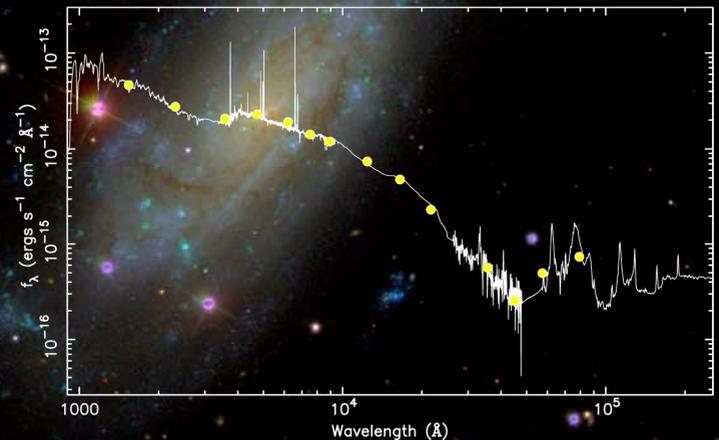
Fifty Galaxy SEDs Spanning from the UV to the IR

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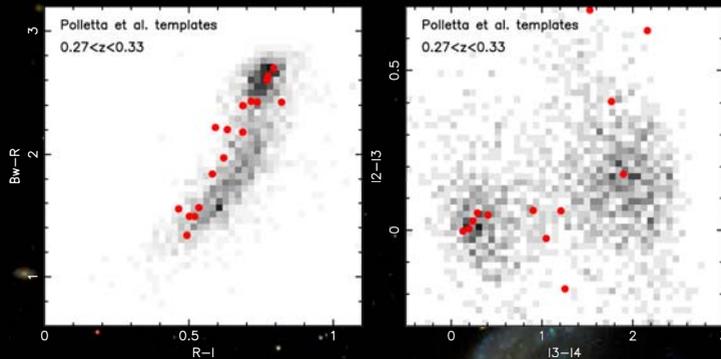


Template galaxy spectra are essential for studies of distant galaxies, enabling physical properties to be derived from observables. This includes luminosities determined via k-corrections and photometric redshifts derived from fitting template spectra.

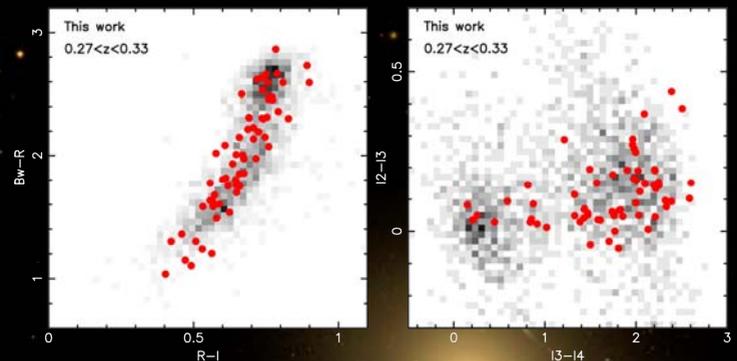
Errors in template spectra result in errors in galaxy redshifts, luminosities and stellar masses. To reduce these errors, we have produced a new set of galaxy template spectra. The 50 templates are derived from IUE UV spectra, Bok 90" drift scan spectra (Moustakas et al. 2006 & 2010), Akari infrared spectra (Imanishi et al. 2010), Spitzer infrared spectra (Brandl et al. 2006, Smith et al. 2007) and SED models (Blanton & Roweis 2007, da Cunha et al. 2008). The templates are constrained with large matched aperture photometry from GALEX, SDSS, 2MASS, Spitzer and WISE.



Our spectrum of Mrk 33, along with the photometry used to normalise the spectra and constrain the spectral synthesis models. There is very good agreement between our spectral templates and the photometry from the UV to the IR.



The observed optical and infrared colours of $z=0.3$ galaxies in Bootes (greyscale) and the Polletta et al. (2007) templates (red dots). While the Polletta et al. (2007) templates are amongst the best currently available, significant errors can be seen. Other templates, derived solely from stellar population synthesis models, often struggle with star forming galaxies, which can have strong nebular lines, PAH emission, dust absorption and dust emission.



The observed optical and infrared colours of $z=0.3$ galaxies in Bootes (greyscale) and our spectral templates (red dots). Our templates exhibit a scatter comparable to the observed width of the galaxy locus. While there are some individual outliers, no systematic errors are apparent. Our templates can be used to produce k-corrections and photometric redshifts with far smaller systematic errors than was previously possible.

References

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Brandl et al., 2006, ApJ, 653, 1129
Bruzual & Charlot, 2003, MNRAS, 344, 1000
da Cunha et al., 2008, MNRAS, 388, 1595
Imanishi et al., 2010, ApJ, 721, 1233

Moustakas et al., 2006, ApJS, 164, 81
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Background

SDSS colour composite images of 4 galaxies for which we have generated template spectra (NGC 3198, NGC 4254, NGC 4552 and NGC 4559).