Galaxies at High Redshift and Their Evolution Over Cosmic Time
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AGN - Dust-Obscured Galaxies at z∼1-3 revealed by near-to-far infrared SED-fitting

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Dust-Obscured galaxies (DOGs, Dey *et al.* 2008) are bright 24μm-selected sources with extreme obscuration at optical wavelengths ($F_{24\mu m}/F_R > 982$). Recent studies (Dey *et al.* 2008, Bussmann *et al.* 2009) describe an evolutionary scenario in which the starbursting nature of submillimeter galaxies (SMGs) evolves into the composite nature of DOGs as an underlying AGN grows; this is followed by a quasar phase that terminates star formation (SF), leading to the formation of a passive, massive elliptical galaxy. Within this context, DOGs could provide a key insight to an extremely dusty stage in the evolution of galaxies at $z \sim 2$, where both AGN and SF activity coexist.

We perform SED-fitting on the 95 *Herschel*-detected DOG sources from Riguccini *et al.* (2015) using composite spectra to obtain AGN contributions: 74% are fit by a host galaxy template while for 16% require an additional AGN component (cf two SED-fitting examples on Fig. 1). Faint DOG sources with $L_{8\mu m} < 10^{12}\ L_\odot$ are dominated by SF at all redshifts, while DOGs brighter than $L_{8\mu m} > 2{\times}10^{12}\ L_\odot$ display a high contribution (>20%) from an AGN component. DOGs with no significant AGN contribution are mainly located within the SF main sequence as defined in Elbaz *et al.* 2011 (cf main panel Fig. 1). Half of those identified as AGN-DOGs (red filled circles on Fig. 1) lie below this sequence, with significantly lower specific SF rates (sSFR). These results support the evolutionary scenario where DOGs may represent a transition phase between high-redshift starburst-dominated SMGs and red-dead ellipticals, passing through an AGN-phase that would quench the star formation.

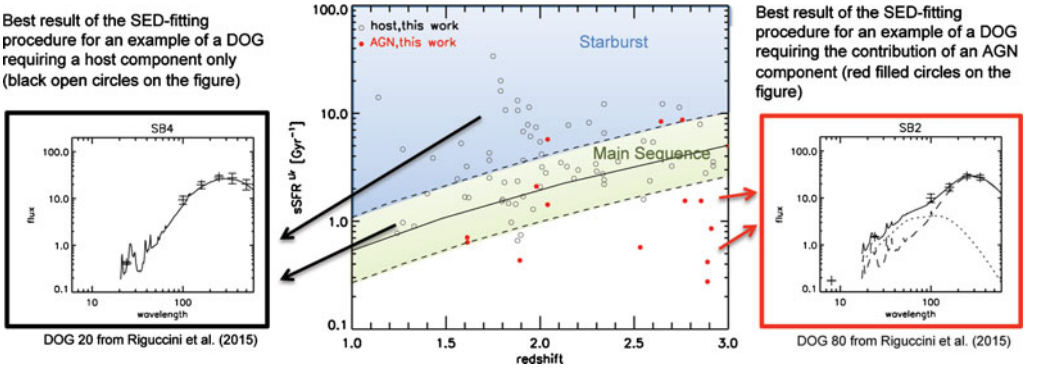

Figure 1. Redshift evolution of the sSFR of DOGs. The solid line represents the SF main sequence from Elbaz *et al.* (2011).

References

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