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On the relative contribution of AGNs and galaxies to reionization

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I will review the arguments in favour of/against a substantial contribution of AGNs and/or star-forming galaxies to the reionization of the Universe at z>5, by using extrapolations of the most recent determination of the AGN and LBG high-z luminosity functions (LFs) and their redshift evolution. A galaxy driven reionization requires a significant contribution of faint dwarf galaxies and a LyC photon escape fraction (f_esc) of the order of ~20 per cent, in tension with observational constraints. I will then focus on the AGN contribution to reionization. In particular, I will present a recent study based on a sample of 1669 luminous QSOs from BOSS. Their f_esc distribution shows a peak around zero and a long tail of higher values, with a resulting mean f_esc~0.75 (independent of the QSO luminosity and/or redshift). Combining this f_esc estimate with the observed evolution of the AGN-LF, we compute the AGN contribution to the UV ionizing background (UVB) as a function of redshift. AGN brighter than one-tenth of the characteristic luminosity of the LF are able to produce most of it up to z~3, whereas at higher redshifts, a contribution of the galaxy population is required. Assuming an f_esc for star-forming galaxies between 5.5 and 7.6 per cent, independent of the galaxy luminosity and/or redshift, a remarkably good fit to the observational UVB data up to z~6 is obtained.

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