*The intriguing life of massive galaxies*
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# Evolution of the galaxy merger rate since z=2 from the UKIDSS Ultra-Deep Survey

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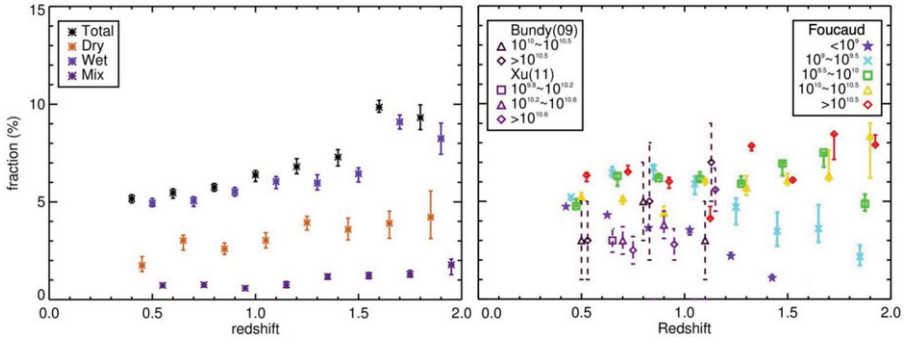
**Abstract.** It is now clear that the epoch when the Universe was half of its current age is a crucial period during which galaxies assembled their mass and evolved into the galaxies we observe in the local Universe. However, so far only very few direct studies of mass assembly in action, hence galaxy merging, were conducted over z=1 and usually relied on very small or biased samples. Based on very deep near infrared survey data, the latest UKIDSS-UDS DR8, combined with the optical data conducted by Subaru and CFHT and Spitzer IRAC observations, we explored the evolution of the merging rate up to $z = 2$, over the largest volume of the Universe at $0.4 < z < 2$ ever sampled. The pair fraction is found to decrease by a factor of two during this period, and wet (gas rich) mergers dominate largely. The dry mergers are very rare, ruling it out as the main mechanism for the mass assembly of passive massive galaxies. Also while massive galaxies undergo a decrease of their pair fraction during this period, less massive systems follow an increase during the same period.

**Keywords.** galaxies: evolution; galaxies: high-redshift




**Left:** Evolution of close pair fraction between z = 0.4 to z = 2.0, for the total sample, the dry mergers (red-red), wet mergers (blue-blue) and mixed mergers (red-blue). Both corrections for projection effect and close pair incompleteness have been applied. The error bars are generated by Monte-Carlo simulation. **Right:** Evolution of our measured pair fractions with redshift in five different stellar mass bins, compared to recent results (Bundy *et al.* 2009, *ApJ*, 697, 1369; Xu et al. 2012, *ApJ*, 747, 85). Our results imply that merger rates in more massive samples decrease with redshifts while increasing for the less massive samples.



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