

The Life Cycle of Massive Red Galaxies

M. Doherty¹

¹ *European Southern Observatory*

Abstract

Samples of Extremely Red Galaxies (ERGs) have generally been seen to comprise a mix of actively star-forming galaxies with significant dust reddening and evolved, passive galaxies, at redshifts about $z \approx 1 - 2$. Initial results from deep Keck spectroscopy of ERGs (Doherty et al. 2005) revealed dominant old stellar populations in 75% of our spectroscopic sample, but only 28% have spectra with no evidence of recent star formation activity, such as would be expected for a strictly passively-evolving population. This study suggests that the bulk of the ERGs are luminous, spheroidal, evolved galaxies, but with intermittent activity consistent with continued growth.

Through template fitting of the spectra and broad-band spectral energy distributions, combined with morphological analysis and Spitzer archival observations we investigate a subset of these objects in detail, to address various outstanding questions. What fraction of their mass is produced in ongoing star formation? Is there a characteristic mass at which star formation is abruptly truncated? What mechanism provokes a secondary burst of star formation in evolved galaxies?