

CONSTRAINTS ON GALAXY EVOLUTION FROM FAINT REDSHIFT SURVEYS, KECK, AND HST

CARYL GRONWALL

UCO/Lick Observatory

Board of Studies in Astronomy and Astrophysics

University of California, Santa Cruz, CA 95064 USA

The nature of faint field galaxy evolution remains controversial. While many workers advocate exotic theories, such as rapid merging or disappearing populations, we have found that it is possible to explain the published counts and redshift data with traditional luminosity evolution models which derive an optimal set of *local luminosity functions* for different galaxy types (Gronwall & Koo 1995). Recently, there has been a tremendous amount of new data addressing this question, including 1) the measurement of the galaxy luminosity function vs. redshift from faint redshift surveys down to $B = 24$ and $I = 22$ (Colless 1995; Lilly et al. 1995), 2) morphological and angular size data from the HST Medium Deep Survey (Driver et al. 1995; Phillips et al. 1995), and 3) redshift measurements with Keck for a small sample of galaxies with $I > 22$ (Koo 1995). We have explored these new data and have found that while our model continues to provide an excellent match to the faintest observed redshift and angular size distributions, it underpredicts the faint counts and luminosity function evolution for very blue late-type galaxies. Since our current model includes only minimal evolution of these galaxies, the new observations suggest a need for additional evolution, perhaps through a starbursting or mild merging component.

References

- Colless, M. 1995, *Wide Field Spectroscopy and the Distant Universe*, eds, S. J. Maddox & A. Aragón-Salamanca, (World Scientific), p. 263
- Driver, S. P., Windhorst, R. A., Ostrander, E. J., Keel, W. C., Griffiths, R.E., & Ratnatunga, K. U. 1995, *ApJ*, 449, L23
- Gronwall, C., & Koo, D. C. 1995, *ApJ*, 440, L1
- Koo, D. C. 1995, this volume
- Lilly, S. J., Tresse, L., Hammer, F., Crampton, D., & Le Fèvre, O. 1995, *ApJ*, in press
- Phillips, A. C., Gronwall, C., Koo, D. C., Forbes, D. A., Illingworth, G. D., & Huchra, J. P. 1995, in preparation