

## Carbon Stars in the Galactic Halo

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A byproduct of the APM high-redshift quasar survey was the discovery of  $\sim 20$  distant (20 – 100 kpc) cool AGB carbon stars (all N-type) at high galactic latitude. We have surveyed the rest of the high latitude SGC sky with  $\delta > -18^\circ$  and found 10 more similar carbon stars. Before our work there were only a handful of published faint high-latitude cool carbon stars known (e.g. Margon et al. 1984, *AJ*, 89, 274; Mould et al. 1985, *PASP*, 97, 130) and there has been considerable speculation as to their origin (e.g. Sanduleak 1980, *PASP*, 92, 246; van den Bergh & Lafontaine 1984, *PASP*, 96, 869). Intermediate-age carbon stars (3 – 7 Gyrs) seem unlikely to have formed in the halo in isolation from other star-forming regions, and one possibility that we are investigating is that they arise from either the disruption of tidally captured dSph galaxies or are a manifestation of the long-sought optical component of the Magellanic Stream. Lack of proper motion rules out the possibility of the majority being dwarf carbon stars (e.g. Warren et al. 1993, *MNRAS*, 261, 185); indeed no N-type carbon stars have been found to be dwarf carbon stars. Optical spectroscopy confirms their carbon star type (they are indistinguishable from cool AGB carbon stars in nearby dwarf galaxies) and hence their probable large distances. We have recently acquired high-resolution ( $\sim 1 \text{ \AA}$ ) spectra for all the SGC carbon stars and the majority of the NGC sample and have determined accurate ( $\sim 10 \text{ km s}^{-1}$ ) radial velocities. We are extending the survey phase to the remainder of the NGC which, coupled with a program of *JHK* photometry, should enable us to probe the phase-space distribution of the halo carbon stars and hence determine their origin.