white dwarf stars has been identified as a resonance broadening of the Lyman α due to the hydrogen quasi-molecule. Likewise, the 13400 Å absorption feature in the spectra of cool and moderately warm DA white dwarf stars appears to be due to a Lyman satellite line arising from the hydrogen ion quasi-molecule. The strength of both features is gravity sensitive and therefore promises to be an excellent indicator of surface gravity. This work was partially supported by The National Aeronautics and Space Administration, Grant No. NAS5-287 and The National Science Foundation, Grant No. AST82-19474.

Optical Studies of Wolf-Rayet (Carbon and Oxygen) Stars

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The classifications of Wolf-Rayet (WR) stars have been done by visual estimates of ratios of equivalent widths of the strongest lines (van der Hucht et al. 1981). For WR carbon (WC) stars, these lines are O 7559 Å, C III 15696 Å and C IV 15512 Å; a further criterion being the full width half maximum (FWHM) of C III 15465 Å. We have analyzed the spectra of nearly all WC and WO (oxygen) stars in the galaxy and in the LMC and here we present a quantitative classification. We find that the later subtypes (WC9 to 9) are very homogeneous in their spectroscopic properties, while the earlier subtypes (WC4 to 6) show a large scatter and a great overlap in their line ratios. Furthermore, the line widths are very similar among the later types but rather disparate among the earlier stars.

A well-known fact is that only early type stars exist in the LMC (Bressanacher, 1981, Astron. Astrophys. Suppl. Ser. 53, 203). We show that they are of an earlier class than previously thought.

We have also measured wind terminal velocities for a great number of stars. The values range between 800 km/s to 3500 km/s. In general, earlier subtypes show larger terminal velocities. WC stars have terminal velocities as high as 6000 km/s.

Chromospheric Activity and Ti O in M Giants

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Low-resolution IUE spectra, obtained for twenty-three cool giant stars ranging from K3 to M5.9, have been used to examine chromospheric activity in late-type giants. Previous studies have suggested a decrease in Mg II resonance flux (an indicator of chromospheric activity), normalized to bolometric flux, with effective temperature. Using more accurately determined effective temperatures we confirm this decrease and find it to be more rapid than previously suggested. A strong correlation is found between Ti O abundance, as measured by the Wing Ti O index, and the level of chromospheric activity, as measured by Mg II fluxes. Cool giants which are underabundant in Ti O relative to the mean abundance levels for stars of similar color, also have chromospheres that are underactive relative to the mean. Possible origins of this relation related to aging effects, or to duplicity are discussed, along with their implications.

Chromospheric Expansion Velocities in Late K and M Giants

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There is mounting evidence that M giants have geometrically extended chromospheres (T_e ~ 8 x 10^3 K) situated between their photospheres and the cool circumstellar regions where the blue-shifted absorption components seen in neutral species lines are formed. These intermediate chromospheric regions are also systematically outflowing away from the star, as indicated by the blue-shifted absorption features in the Ca II and Mg II resonance lines. Using high dispersion spectra obtained by IUE, we have measured the positions of these wind absorptions in the Mg II lines of 20 late K and M giants and supergiants, and find typical expansion velocities of 10 to 25 km s^{-1}. Two giants, γ Dra (K5 III) and u UMa (MO III; P orb = 2305), have abnormally high chromospheric expansion velocities of 65 and 55 km s^{-1}, respectively, making them, we believe, interesting objects for detailed spectroscopic studies. We compare the Mg II wind velocities with those obtained from the Ca II, Mg I, and neutral species resonance lines, and find no systematic differences, implying that the stellar winds in M giants have reached their terminal velocities within the few stellar radii. In one case, 8 And (MO III), we find that the wind velocity, as determined from different IUE spectra, has significantly varied between the two epochs. Finally, we discuss the effects of interstellar absorption on the Mg II line profiles of these stars, and the reliability of simple, kinematical models of the local Interstellar Medium. This