

**Title:** Cool Stars Sing the Blues  
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### **Abstract**

A high-dispersion spectral atlas of cool red giant stars in the blue and violet is presented. The spectra were obtained over a six-year time period with the stellar spectrograph of the McMath-Pierce Telescope on Kitt Peak. Both N-type carbon stars and M-type oxygen-rich stars are presented from 3900 to 4600 Å, with the M-type stars containing both semiregular and Mira-type variables. The dominant absorption features in these stars at these wavelength result primarily from neutral metals, especially iron, and the CH and CN diatomic molecules. The Miras also show strong emission lines during some of their pulsation cycle. Many of these emission lines result from fluorescence from the Mg II h & k lines in the UV. For these fluoresced features, comparisons are made between the Miras and the semiregular carbon-rich and oxygen-rich variables. Where the oxygen-rich semiregulars show no hint of fluorescence in these features, the carbon stars show a definite "filling-in" of the absorption lines.