22.18 Spectrophotometry of the New Supernova in IC 1731. ALAIN PERREY, Caltech. We discovered a supernova in the galaxy IC 1731 on October 1, 1983. Nine spectra were obtained between October 5 and the time of this writing (November 4) with the 5-m Spectrograph on the Palomar 1.5 meter telescope. It is a Type I object, with a deep absorption band near 6100 Å shortly after maximum, and other absorption features in the wavelength range 3700-5000 Å. Reduced spectra will be presented at this meeting and compared to past observations of Type I supernovae.

Session 23: Stellar Spectra
9030-1630 (Student Union Display Room) (Display Session)

23.01 High-Resolution Line-Strengths of SNR K giants. B. BURSTEIN, S. E. BOND, E. N. FABER, Lick Obs.

High-resolution, near-infrared spectra are presented for nine local, field, K-giants. The sample stars are well matched in temperature but exhibit a wide range of line strengths, as judged by low-resolution, image-dissector scanner spectra by Faber, Przylucki, and Sargent, 1981. Four normal stars and four classic supernova remnants (SNR) stars are included. The present high-dispersion spectra were taken with a cooled reticon array at the coude focus of the 3 m Shane telescope of Lick Observatory. They have a spectral resolution of ~0.2 Å (FWHM) and are located near 8700 Å and 9000 Å.

Line-strength rankings of the stars at low and high dispersion agree well. In particular, the SNR stars show enhanced line strengths at high dispersion, including even weak lines of only a few tens of mÅ in strength. These results confirm and extend those of Branch, Bonnell, and Tomkin, Ap. J. 225, 902, 1978, who compared the SNR star v Leonis to the normal star z Aries. The results of the high-dispersion spectra can be used to calibrate the low-dispersion results. The degree of line strengthening is comparable to that shown by the four SNR stars studied here. It is probable that eventual abundance analyses of these SNR stars based on these new spectra will show them to be significantly metal-rich.


Spectra of the cool and apparently single B7/8V white dwarf GD356 obtained by J. L. Greenstein on four nights using the double spectrograph at the Cascades Grinnell Observatory show the Balmer alpha and beta lines of atomic hydrogen strongly present in emission and split into three widely separated components by the Zeeman effect. We have determined the "best-fit" line centroids and equivalent widths, which indicate a field strength in excess of 10^7 G and the unusual Balmer decrement H-alpha/H-beta of 0.74. No changes in Zeeman component strengths are seen over the four nights.

Using the Zeeman splitting calculations for high magnetic fields of S. B. Kewley (JILA Report 11) and the non-LTE level populations for hydrogen given by S. A. Drake and R. J. Ulrich (Ap. J. Suppl. 48, 451), we have explored the high field region assuming it is optically thin in the Balmer lines while optically thick in the Lyman alpha. We find the best match to the spectra for a highly ionized, geometrically thin shell of rather high density (N_e ~ 10^{14} cm^{-3}) in which there exists a dipole magnetic field whose polar value is approximately 20 megagauss. We also show that a more extensive corona-like region of lower density but larger volume can be ruled out on the basis of the low value of the Balmer decrement observed. In addition, such a large extended region containing a dipole field is ruled out by the lack of emission in the observed Zeeman patterns at wavelengths corresponding to field strengths below about 10 megagauss.

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23.03 Characterization of the Fe II and C II Chromospheric Emission Lines in Alpha Ori as a Function of Time. J. L. GREENSTEIN, J. A. & U. of Co. I present results of a preliminary analysis of the ultraviolet (2300 - 3800 Å) chromospheric emission lines of C II and Fe II in a series of high resolution IUE spectra, taken over a six-year period, of the M-supergiant Alpha Ori (M2Iab). The wavelength range of the IUE spectrograph contains a large number of Fe II and C II lines of excitation energies and intrinsic strengths. These lines are thus sensitive to a wide range of temperatures and heights in the outer atmosphere of Alpha Ori. The relative line strengths, velocities, and asymmetries of these lines and their correlations with excitation levels and transition strengths can thus provide information on the radial structure (velocity, density, and temperature) of the wind. I present measures, made at the Colorado Regional Data Analysis Facility, of the strengths, velocities, and asymmetries of the Fe II and C II lines and the results of a search for correlations with various atomic parameters.

The relative and absolute fluxes of the C II intercombination lines near 2325 Å are sensitive to the density and geometric extent of the wind in late-type giants and supergiants (Stencel et al., 1981, MNRAS, 196, 47p). I present flux measurements of the C II lines in these IUE spectra and give the results of a preliminary analysis of the data and its implications for the variations in the density and geometric extent of the material in the Alpha Ori wind with time.

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23.04 Five Days in the Life of a T Tauri Star: Preliminary Results from a Spectroscopic and Photometric Monitoring Campaign. P. M. WALTER and A. BROWN, JILA. The T Tauri stars are of interest for several reasons. In hopes of gaining insight into the nature of the atmospheres of T Tauri stars, their extended envelopes, and how they vary, we organized a campaign to monitor, both

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