ABSTRACTS

100.10
The Ultraviolet Photospheric Spectrum of α Orionis
G. M. Wahlgren, R. D. Robinson (CSC/GHRS) and K. G. Carpenter (LASP/NASA/GSFC)

The Goddard High Resolution Spectrograph (GIRS) team has obtained complete wavelength coverage of the α Ori spectrum from 2000 to 3300 Å using the moderate resolution (R = 20000) mode of the GIRS onboard the Hubble Space Telescope. This atlas supplements the low resolution spectral data (1000 - 2000 Å) previously obtained. The spectrum is rich in both emission and absorption features and will prove to be useful in studies of cool star chromospheres. Longward of 2500 Å the photospheric continuum becomes a prominent feature of the spectrum, although a continuum can be seen below this wavelength. We have previously reported on the continuum flux shortward of 2000 Å that likely originates in the chromosphere. By comparison with IUE high-dispersion spectra (Wing, Carpenter, and Wahlgren 1983, Atlas of High Resolution IUE Spectra of Late-Type Stars) it becomes obvious at the higher resolution of the GHS spectrum that many of the highest flux levels in the IUE spectrum longward of 2500 Å are actually weak emission lines. Thus, the photospheric continuum can be more accurately located in the GHS spectrum. We have fit the photospheric spectrum with synthetic spectra generated by the SYNTHE code (Kurucz) in order to study the absorption spectrum. Such an analysis will be useful for comparing the abundances of elements in the photosphere and circumstellar environment, detecting weak fluorescence processes, searching for previously unidentified molecular absorptions, and improving emission-line fluxes.

100.11
High Resolution Speckle Imaging of Stars with Composite Spectra
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We report the first application of a speckle imaging system developed at Georgia Tech Research Institute to the study of stellar objects. The GTRI system has been designed for high resolution (≪0.2") recovery of faint and bright objects, and it utilizes a CCD camera with a quantum efficiency approaching 90%, optimized for low readout noise (≈ 8 electrons) at high read rates (10^6 pixels/second). Observations of stellar and solar system objects were made using the 2.4-meter and 1.3-meter telescopes at the Michigan-Dartmouth-MIT Observatory in September 1992. Speckle images of 57 stars classified as having "composite spectra" in the Michigan Spectral Atlas and an additional 8 long-period variables believed to have companions were obtained to search for or confirm duplicity; imaging studies of Mars to detect and differentiate dust storms from water vapor clouds were also carried out. Results of the speckle astrometry programs are presented, as well as a fuller description of the performance characteristics of the imaging system under actual observing conditions.

100.12
Spherical Expanding NLTE Model Atmosphere Studies of Nova Cyg 1992
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We show synthetic spectra for Nova Cyg 1992 during the early, optically thick phase of its evolution. The model atmospheres are calculated using the assumptions of a steady state, spherically symmetric wind model for the early envelope. We solve the non-grey special relativistic equations of radiative transfer and radiative equilibrium in the Lagrangian frame. Non-LTE effects are included self-consistently, as is the effect of line blanketing of about 100,000 UV metal lines (the "iron-curtain"). The models assume a radial density gradient (ρ ∝ r^-2) and self-similar expansion. These follow from hydrodynamical calculation of the nova outburst and from late time observations of Nova Cyg 1992.

We show comparisons between our synthetic spectra and observed IUE low and high resolution spectra and medium resolution optical spectra of Nova Cyg 92 and discuss some of the properties of the spectra and the model atmospheres. An especially important generalization from our models is that the pseudo-emission features, resulting from line opacity minima, are sensitive to the velocity gradient in the ejecta.

100.13
IUE Observations of HDE 332077
T. Ake (CSC), A. Jorissen (ESO), H. Johnson (Indiana U.), M. Mayor (OBS. de Genève), B. Bopp (U. Toledo)

The Te-poor S star HDE 332077 has been found by Jorissen and Mayor (A&A, 260, 115, 1992) to be a spectroscopic binary with an unusually high mass function. According to our current understanding of the Te-deficient S stars, the abundance peculiarities of the primary should have been the result of mass-transfer from the secondary star when it was on the asymptotic giant branch at an earlier time. The secondary should now be a white dwarf (Johnson, Ake, and Amseem, ApJ, 402, in press). For HDE 332077, Jorissen and Mayor argue instead that the mass function, B − V color, and UV upper flux limits constrain the secondary to be an A-type main sequence companion and the primary to be more luminous than typical S stars. The system is still considered to be a post-mass transfer binary since the mass ratio is reversed for any set of reasonable masses.

We have obtained IUE low dispersion spectra of this system. The LWP region is quite unusual. The spectral slope is steep and the absorption line spectrum is washed out, while Mg II 2800 Å is strongly in emission. A trace of spectrum appears on a 20 hour exposure with the SWP, with a mean flux level of 6 x 10^-16 erg cm^-2 s^-1 Å^-1 in the 1730 − 1800 Å region. The spectral slope in the SWP is indeed that of an A-type star, but it is difficult to match the LWP and SWP fluxes simultaneously with a simple addition of a red giant and early main sequence star.

100.14
High-Resolution Spectroscopy of Extremely Metal-Poor Stars
T.C. Beers (Michigan State), R.C. Peterson (UCSC)

We present a progress report on follow-up high-resolution spectroscopy of extremely metal-poor stars selected from the HK interferometer-filter/objective-prism survey of Beers, Preston and Shectman (1992, AJ 103, 1987). We have derived calcium abundances for about two dozen candidates with [Fe/H] < -3.0, using CITO 4m echelle spectra of the Ca II triplet features, from which the calibration of the BPS metallicity scale at low metallicities may be refined, and the metallicity function re-examined. For a handful of the most metal-poor giants in this group, additional CITO blue spectra at a resolution of 50,000 have been obtained to derive the abundance ratios of a variety of elements, light and heavy. We discuss these abundances in the context of previous work on the most metal-poor stellar abundances.

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