35.07 A Comparison between the Observational and Theoretical HR-Diagrams for the LMC Star Cluster, S. A. BECKER and G. MATHIUS, Kellogg Radiation Lab., Caltech - NGC 1966 is a rich blue globular cluster containing many variables and Cepheid variables. Observations by Arp and Thackeray 1967, Ap. J. 149, 75, Robertson 1974, Astr. Ap. Suppl. 16, 251, and Walker 1974, M.N.R.A.S. 192, 292 have determined V and B-V colors for hundreds of the cluster members. This wealth of data has led to attempts by Meyer-Hofmeister 1969, Astr. Ap. J. 2, 125, Robertson 1974, Ap. J. 191, 67, and Harriss and Depree 1976, Ap. J. 209, 402 to compare the observed color-magnitude diagram with synthetic cluster models as produced from a series of stellar evolution tracks. Using this approach, the age, the age spread, and composition of the cluster stars can in principle be determined. These past attempts have been moderately successful in matching some of the features of the observed color-magnitude diagram; however, all this work was done with models having initial compositions which are unrepresentative of that believed to exist in the LMC. We will report on our attempt to compare theory and observation in the case of NGC 1966 based on the Peimbert and Torres-Peimbert 1974, Ap. J. 193, 207 composition of (Y,Z) = (0.289, 0.0085).

35.08 C and N Abundances in Giant Stars of the Metal-Poor Globular Cluster M15, G.E. LANDIS, C.F. THOMPSON, N.I. SOHN, R.P. KRAFT, Lieb Obs., RSA. UC Santa Cruz, and D.F. CARSON, KNO, Athens - We have determined carbon and nitrogen abundances for approximately 10 giant stars in the metal-poor globular cluster M15 from intermediate resolution spectra. The abundances are virtually identical to those of similar giants in M92 (Carbon et al., 1982, Ap. J. Suppl., in press). The carbon abundance drops by a factor of about 5 along the giant branch above \( M_{g} < -1.5 \); there is no sign of the break at or above \( M_{g} > 0.7 \) that is predicted by the Sseigart-Mangol mixing mechanism. Stars side by side in the color-magnitude diagram show variations in C abundances by factors up to \( 3 \). Nitrogen abundances are typically high \((\frac{\text{[N/Fe]}}{\text{[Fe/Fe]}}) \approx 0.6 \) and stars side by side in the color-magnitude diagram show variations in N abundances by factors up to \( 3 \). There is no evidence for two distinct nitrogen abundances, one high and one low. The total number of C + N atoms varies significantly from star to star at all points along the giant branch.

The similarity between M15 stars and M92 stars strengthens the recent suggestion (Kraft et al., 1982, Pub. A.S.P., in press) that the metal-poor giant stars in the field are drawn from a distinguishably different stellar population than the giant stars in the most metal-poor globular clusters.

35.09 H observers of FK Comae, B. W. BOPP, U. of Toledo-FK Comae is the prototype of a remarkable group of G-K giants characterized by very rapid rotation \((\text{sin}\ i < 100 \text{km/s})\), extremely high levels of chromospheric activity, low-amplitude photometric variability, and apparent lack of any large periodic radial velocity variations (Bopp and Stencil, Ap. J. Lett. 1981, 131). It is likely that the FK Comae stars are the descendants of the U UMa binaries. In this scenario, the contact system evolves toward increasingly extreme mass ratio, transferring orbital to rotational angular momentum, and ending in eventual coalescence.

This paper will discuss the long-term behavior of the H observers feature in FK Com, using data from H. E. Link, KPNO, Ritter Observatories. The broad, highly variable H emission feature cannot be chromospheric in origin, but has been attributed to a disk of material in a fully coalesced system (Ramsey, Ap. J. Lett. 1980, in press) or to a mass transfer mechanism in an extreme mass-ratio binary evolving toward coalescence (Walter and Basri, preprint). The behavior of H at several epochs is examined and interpreted in the context of the various models.

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35.10 Results of an IUE Program of Monitoring the Ultraviolet Emission Line Fluxes of Four Binary Systems: HR 1099, II Peg, AR Lac and BY Dra, T. L. LENSKY, G. T. STOPOLOV, C. LYKOU, N. MARSTAD, JIKA, U. of Colo. & HBS, N. RODON, C. BLASCO, C. R. ESCHER, Observatorio Astronomico Astrofisico, Catania, Italy, A.D. ANDREWS, C.J. BUTLER and K. W. BUCHANAN, ARA Obs., ARA, N. Cal. - We observed three RS CVn-type binaries (HR 1099, II Peg, and AR Lac) and the prototype BY Dra binary system with IUE on 1-7 October 1981. These stars were observed by IUE 3-5 times each at regular intervals throughout the year, with ground-based photometry and radio observations. Each IUE observation consisted of several low dispersion SFM spectra and several high dispersion IUE spectra. We will report on flux variations of emission lines formed in the chromospheres and transition regions of these stars and whether these variations are in phase or out of phase with respect to the photometric variations that indicate the location of dark star spots. We will also discuss asymmetries in the Mg II lines, and whether they indicate flows or formation by both stars at their respective radial velocities in these systems. During our monitoring HR 1099 flared once and II Peg flared twice. Near the peak of the flare on HR 1099 the C IV line flux increased a factor of 3, and we obtained a high dispersion SFM spectrum that we will also discuss.

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35.11 Extraction of the Secondary's Radial Velocity Curve from Classically Single-Spectrum Binaries, E.J. DEVINENY JR., Siemens Corp., & G.S. SUTTON, U. of PA - The application of modern signal processing methods should extend our ability to