morphologies of coronal features sampled in the stigmatic spectra are known and can be related to underlying chromospheric and photospheric phenomena. Doppler shifts of emission lines from He II (40,000 K) to S XIV (3 million K) were measured for loops, interloop regions, and the initial phase of a subflare that were imaged along the slit. The effective noise level (due to grain noise in the photographic emulsion) of determining line centers corresponded to less than 1 km/s in the strongest emission lines. Line-of-sight velocities (both away from and toward the observer) were generally greatest at temperatures below 1.5 million K and above 2.5 million K. RMS line of sight velocities for ten regions ranged from 1 km/s or less in Fe XV emission (2.5 million K) to 5 km/s in Si IX emission (1.2 million K). These magnitudes are insufficient to account for previous observations of excess line broadening as spatial averages over numerous emitting regions with random bulk mass motions. Our observations show emission lines consistently broader than expected from thermal motions, even at spatial scales of 5 - 10 arc s.

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3.13 Observational Evidence for Heating through MHD Turbulence in Coronal Active Regions
We report the results of a search for observational evidence about the presence of a turbulent state in coronal active regions. We have selected isolated regions observed by NIXT in its rocket flight of September 11, 1989. The photographic soft X-ray images of these regions have a spatial resolution of 3/4 arcseconds and have been digitized (0.44 arcsec. pixel) and calibrated to allow their numerical processing. We have obtained broadband omnidirectional power spectra for the soft X-ray intensity of each of these regions.

The spectra indicate the presence of a fully developed turbulent state. Moreover, they confirm the predictions of two-dimensional MHD theory for the development of an inverse cascade of helicity, corresponding to self-organization of the magnetic structure. The theoretical slope for passive scalar spectra fits very well with our observational spectra. Simultaneously the energy will cascade towards high wavenumbers where Joule dissipation is efficient enough to heat the coronal plasma (van Ballegooijen 1986, Ap. J. 311, 1001; Gomez and Ferro Fontan 1988, Solar Phys. 116, 39).

4.02 Preliminary Results for the Distances to Runaway and O-Type Stars
R. Costero (IA/UNAM)
The stars around a few runaway and field O-type stars have been observed in the uvby-B Stromgren photometric system in order to find their distances and, hence, their visual luminosities. An interstellar extinction vs photometric distance relation is derived for the direction in the sky where the objects of interest are and the distances to the latter are estimated. The preliminary results after the observations done in seven field and runaway stars will be given in this paper, as well as a tentative conclusion as to whether or not this type of stars are evolved, low mass objects.

4.03 Further Observations of the Planetary Nebula in the Globular Cluster M22
K. M. Cudworth (U Chicago/Yerkes Obs.)
The proper motion of the central star of the recently-discovered planetary nebula in the globular cluster M22 strongly confirms cluster membership, in agreement with radial velocity data from the discovery group. An accurate optical position of the central star differs by a few arcseconds from the IR source position derived by the discoverers, but it is unclear whether this difference represents a real displacement between the peak of the IR emission and the central star or merely the uncertainty in the IR position. Photographic photometry of the star on plates spanning nearly a century shows that the star has probably brightened ~0.2 mag in B since 1900, but there is no evidence of variations on shorter time scales. Dust within the nebula is probably responsible for the excess reddening of the background red companion to the central star. This research has been partially supported by the NSF.

4.04 The Abundance and Deep Color - Magnitude Diagram of NGC 5927
D. Geisler, N. Suntzeff, D. Terndrup (NOAO/CTIO), E. Friel (DAO)
Washington and BVI photometry is presented for the globular cluster NGC 5927, one of the most metal-rich in the Galaxy. The Washington photometry, obtained with the CTIO 0.9m CF/CCD