launched with the first Skylab Mission in May 1973, and were operated by successive astronaut crews during three manned periods, ending in early February. Certain of the experiments were capable of operating remotely during the unannounced intervals, and during periods when the crews were not available for solar operations. The ATM instruments represent a considerable advance in observing capability owing to their high spatial resolution, their extensive combined spectral coverage, and the presence at the control console of a solar observer.

Selected data from each of the ATM experiments will be used to illustrate the range of observational capabilities represented by the ATM: the white light coronagraphs from the High Altitude Observatory, ultraviolet data from the Naval Research Laboratory and Harvard College Observatory, and x-ray results from American Science and Engineering, and the Marshall Space Flight Center and Aerospace Corporation experiments.

Preliminary scientific results will be presented and discussed to illustrate the combined experiment approach to certain solar physics objectives represented by the ATM Joint Observing Programs (JOP's), and the coordinated ground-based observing programs which were arranged to complement the space observations to selecting daily objectives in response to changing solar conditions, and the role of each in the observing program will also be discussed.

12.01.05 The Formation of the H\\textsubscript{\alpha} Emission Feature in Late-Type Stars. Z. R. ATREY and J. L. LINKS, Joint Institute for Laboratory Astrophysics. - An emission feature—in the near wing of the Ca II H-line—especially common in K-type giants has been attributed to the Balmer line H\\textsubscript{\alpha} (Wilson, 1956 Astrophys. J. 729, 46). We show that the appearance of H\\textsubscript{\alpha} emission can be understood as a simple effect of the suprathermal (photoinization controlled) hot plasma; the Balmer line is seen against the thermal background of the H-line wing [S\textsubscript{H\textsubscript{\alpha}}(\text{line}) = S\textsubscript{H\textsubscript{\alpha}}(\text{wing})]. The presence or absence of emission is a sensitive function of the stellar surface gravity and metal abundance, and to a lesser extent the effective temperature of the star. The surface gravity controls the width of the Ca II H-line and hence the background intensity at $\lambda = \lambda_{\text{H\textsubscript{\alpha}}}$ (h$_{\text{\beta}}$ - h$_{\text{\gamma}}$ = 1.6). The metal abundance affects both the width of the H-line and the opacity weighting of S\textsubscript{H\textsubscript{\alpha}}(\text{wing}).

12.02.05 Formation of the Sodium D Lines in Arcurus. W. L. KELCH, Goethe Link Obs., Indiana U. - Preliminary results of a study of the formation of the Sodium D lines in the KIII giant Arcturus are given. The work was done with a program of Ameer, Hasley and Milkey (KNO Contribution 5555) which solves the transition problem by the complete linearization method. Our model sodium atom includes levels of 6 bound electron states. We use the photoionization and collision cross-sections of Chamberaux (1967, Ann. d'Ap., 30, 67) and photoionization cross-sections of Tschech (1967, Mem. RAS, 71, 13) for the free-electron collision for all bound levels below 4p, b$_{j}$ < 1 for m < 10.0 and b$_{j}$ < 10$^{-2}$ by m = 5 x 10$^{-3}$ (where m = g/cm$^2$ above a particular depth in the atmosphere). For the D lines b$_{\text{\beta}}$/b$_{\text{\gamma}}$ = 1.25-3 in the region of line formation. However, the addition of a fictitious energy level 3.33 ev above the ground state, intended to represent the high-lying energy levels and give a more accurate coupling to the continuum, increased the bound state populations by nearly an order of magnitude and increased b$_{\text{\beta}}$/b$_{\text{\gamma}}$ by a factor of 2. Modifying Tschech's model involving the higher levels had little effect. The predicted D line profiles were compared with those in the Arcurus Photoelectric Atlas (F. Griffin, 1958). A microturbulent velocity of 2.0 km/sec was used throughout the atmosphere and the abundance of sodium was taken to be one-third solar. The predicted lines were found to be too weak throughout the wings in both cases discussed above. The same was true for the 3D-3P transitions at 11018 and 8194. The effects of increasing the microturbulence outward in the atmosphere, increasing the sodium abundance, and including collisions with neutral hydrogen in the collision rate formulation are being studied.

12.03.05 Line Profile of the O I Infrared Triplet in Vega. L. R. DOHERTY and LEE W. HARTMANN, Washburn Obs. - Photoelectric, single-channel scans of the O I 17726 triplet with a resolution of 0.15 A were made with the echelle spectrometer attached to the 90-cm reflector at Pine Bluff Observatory. The observed profile is consistent with the theoretical profile formed under conditions of LTE and normal oxygen abundance, if the assumed microturbulent velocity is not too large. The required value of approximately 5 km s$^{-1}$ falls within the observed range of microturbulent velocities for Vega. (W. A. GRIFFIN, Astron. and Astrophys. J. 113, 325). A rotational velocity of 20 km s$^{-1}$ best fits the observed profile. This research was supported by the National Science Foundation.

12.04.05 Two-Dimensional Spectral Classification of the Southern HD Stars. W. HOUK, Univ. of Michigan - Systematic spectral classification of the southern HD stars is continuing, using Michigan L$^*$-size objective-prism plates which give a dispersion of 110 A/mm at H\textsubscript{\alpha} and a resolution of about 2 A (1971 B.A.A.S., 3, 403). 260 multi-exposure Schmidt plates of about 1/2o standard fields are available, covering a wide range of densities. Nearly half of the stars classified so far, including virtually all the A and B stars, have been compared directly with one or more standard spectra. The first volume, nearly ready for publication, contains 36,000 HD stars, about 50% more than the number originally estimated. It is one of several volumes to be published by declination zone from south to north and contains all the HD stars between $\delta = 55^\circ$ and the south pole. Internal and external classification errors will be presented. Internal errors have been determined by computer, using stars classified more than once independently on overlapping plates. External errors have been computed by hand, using available published MK types. Plots of the new MK spectral types vs. HD types will be shown. Over the whole spectral range there is a great deal of scatter, but the B stars are classified systematically late in the HD, the A stars are systematically early, and mid-F to mid-O stars are systematically late. The new catalogue, also available on magnetic tape, will contain the HD number; spectral and luminosity type; spectral quality; indication of remark in back of catalogue; pg magnitude, 1900 position on HD catalogue, 100-year precession; galactic coordinates to tenth of a degree; and plate code, from which plate number and date of observation can be obtained. Approximately 10% of the stars have remarks in the back of the