Recent Attempts to Observe Occultations of Stars by Minor Planets and Predictions of Planetary Occultations for the Remainder of 1978. D. W. DUNHAM, International Occultation Timing Association - At the last A.A.S. meeting in Austin, general information which can be gathered from the observation of occultations by minor planets, the observational prospects, and I.O.T.A.'s efforts to increase the number of predicted events were presented (BAAS 2, 621, 1977). Recent observational attempts will be discussed, especially the coordinated efforts to photographically record the occultation of 50.88754 (Vesta) by Pallas on May 29, including use of the Kuiper Airborne Observatory by J. Elliot and other Cornell astronomers. Predictions for occultations which will probably be visible from parts of the U.S. during the rest of 1978 will be presented; some data about them have been published elsewhere (Sky and Telescope 55, 51, 1978 Jan., and 55, 356, 1978 April). On October 8, Uranus will pass 25° north of 2,9-mag, ατ Librae. Material in the orbits of Titanus and Oberon, perhaps like the Uranian rings or like the sodium cloud of Io, could occult the star. A possible occultation of 10.7-mag, Α053+13° 203 by 1977 UB (Chiron) on July 24 is noted.

H. Observations of Jupiter Following the Solar Flare of April 11, 1978 - J. HUNTER and K. S. SCHLEPPER, Univ. of South Fla. - In the interval January - May, 1978 observations of Jupiter in H, light were continued at the Univ. of South Fla. Observatory. For details of the equipment and observing technique, see R. S. Clary and J. H. Hunter (1975 Astrophys. J. 199, 517) and B. Holman and J. H. Hunter (1978 Astrophys. J. 223, 906). Owing to the exceptionally fine observing conditions that prevailed during the month of April, we were able to carry out a nightly photographic patrol of the planet following the large solar flare of April 11. From April 11 - 23 a few hundred H, photographs of Jupiter were taken with one minute time resolution through a coherent, double Fabry-Perot etalon of 0.36A half power width. Rough calibration of the photographic data was accomplished by taking H, photographs of Saturn's rings using a variety of exposure times and with the filter tuned to several slightly different wavelengths. We conclude that, following the flare of April 11, no localized H, emission occurred on the Jovian disc having an intensity in excess of 20% of the reflected H, feature. This conclusion holds as well for the other H, photographs of Jupiter taken during the 1978 observing season.

Hydrodynamic Simulations of Flare/Surge Events, STEINHOFER, R. S., The University of Alabama in Huntsville, SCHMAHL, E. J., Harvard-Smithsonian Center for Astrophysics, and WU, S.T., The University of Alabama in Huntsville - A one-dimensional, hydrodynamic, time-dependent model has been developed which simulates the major observed dynamics of flare-associated surges. In particular, the thermodynamics, the energetics, the time scales, the physical dimensions, and the velocities of typical surge events are reproduced. The surge is created by a sudden increase in pressure at the top of the chromosphere. This pressure pulse produces a disturbance which is followed by a time-dependent numerical solution, as it propagates upward thru the transition region and into the corona.

The leading edge of the disturbance is a weak shock which has only a slight effect on the original transition region and coronal thermodynamics. The major effect occurs in a region behind the shock where the temperature is decreased and the density is increased by approximately an order of magnitude (the exact changes depend on the magnitude of the initial pressure pulse). This cool, dense region (the simulated surge event) moves upward approximately 3 x 10^4 km for about 10 minutes (again these values depend on the magnitude of the pressure pulse) and then begins falling back downward. After the material begins returning to the chromosphere, a second shock is formed in the chromosphere which propagates upward, brings the infalling material to rest and returns the atmosphere to conditions near the original conditions.

The Effect of the Frequency Dependent Stark Broadening Parameter on Partial Redistribution (FDR) Calculations D. ROUSSEL-DUPRE, LASP, U. OF COLO., AND R. S. BASSIL, JILA, U. OF COLO. AND NASAL BUREAU OF SMALL STANDARDS, BOULDER, CO. - We have used the unified theory of Vidal, Cooper and Smith (1970) to obtain a frequency dependent Stark broadening parameter. This frequency dependence appears in the coherence fraction of scattering in the transfer equation (Cooper, 1978), while previous work has assumed a frequency-independent coherence fraction. This new formalism is applied to calculations of the H I wing, leading to reductions in intensity of 2-3 times, and a steeper profile near line center. Recent progress and comparisons to observations will be presented.

Convective Instability of Flux Tubes in the Solar Photosphere, SPRUIT, H. C., HAO/NCAR - The stability of thin flux tubes extending vertically through the photosphere is studied in an attempt to understand the observed magnitude of the field strength of small tubes. The tubes are characterized by a depth independent value of β = ηβ/π (such tubes have about the same temperature as their surroundings). For small field strengths, the tube is subject to an instability of convective type; the critical value of β > 2.3, corresponding to B = 1200 G at η = 1. Tubes with a higher field strength are stable. This sets a lower limit on the expected field strength of long-lived (≥ 15 min) tubes.

It is shown that the unstable tubes (β > 2.3) can transform into a stable state of lower energy, which is characterized by a downward displacement of matter along the tube. This new state is cool with respect to its surroundings; its field strength is always higher than 1200 G.

It is argued that this process would concentrate an initially weak field on the sun into tubes with surface field strength of 1200 - 1800 G.

Solar Limb Brightness Oscillations, Brown, T. M., Sacramento Peak Observatory, AURA, Inc. - The vacuum telescope and diode array at the Sacramento Peak