Galactic Shock Waves: The Perseus Arm. W. W. Roberts, Jr., Univ. of Virginia. - It has been suggested that galactic shock waves form the fundamental connecting link between the interstellar gas and the spiral structure in a galaxy by providing a mechanism that could be capable of triggering out of the gas the formation of young optical objects along luminous spiral arms (cf. Roberts, W.W., 1969, Ap. J., 158, 123). An examination of (1) optical data on young galactic clusters, H II regions, O associations, and interstellar absorption lines and (2) 21-cm line hydrogen maps of the Perseus spiral arm indicates that the peculiarity of these associations with the interstellar medium there may be a significantly more extended phenomenon than previously recognized, stretching in longitude from 100° all the way around to 195°. In light of the observational data, a model for the Perseus arm based on the galactic density wave and shock wave concepts is proposed. The model considered is the two armed spiral shock model that describes the large-scale motion of the interstellar gas, and the young optical objects born out of the gas, over the large-scale galactic disk. The Perseus arm, as viewed in this model, consists of a galactic shock wave embedded in a background density wave. In this model the peculiar motion along the entire length of the Perseus arm can be accounted for.

Of even greater significance is the fact that the apparent discrepancy in the spatial arrangement of the optical spiral arm and the neutral hydrogen spiral arm is found to disappear in this model, and all the heretofore apparently separate Perseus features now appear to actually coincide as one composite arm.

Identification of Two Distinctive Types of Centimeter Radio Bursts with Flare Location. J. P. HAGEN, D. F. NEIDING, Penn State Univ. - The location of the active part of a flaring region has been correlated with the type of centimeter radio burst associated with the flare. It is found that flares which occur over a sunspot, S type, usually produce a centimeter radio burst which has a spectrum peaked at a frequency in excess of 10 GHz whereas flares occurring away from the spot, P type, produce radio spectra peaked in the region of 3000 MHz. The results discussed are mainly for flares of class 1 or smaller producing "simple" radio bursts. The effect is interpreted invoking the synchrotron mechanism and assuming a structure for the spot magnetic field. Bursts of energetic electrons whose energy spectrum peaks at about 3 Mev are shown to be responsible for the radio events.

ENUV Solar Spectra: Abundance Determinations in Quiet and Active Regions. A. K. DUPREE, Harvard College Observatory. - The Harvard College Observatory spectrophotometers aboard OSO-IV and OSO-VI obtained extreme ultraviolet (300 - 1400 Å) spectra of restricted regions on the solar disk. The spatial resolution of 1 arc minute (OSO-IV) and 3 arc second (OSO-VI) and the offset pointing capability of the spacecraft allowed spectral scans to be made of both the quiet sun and active regions. The averaged quiet sun spectrum from OSO-IV (Dupree, A.K. and Reeves, E.M., Ap.J., May 1971) and selected spectral scans from OSO-VI have been analyzed to determine relative coronal abundances of carbon, nitrogen, oxygen, neon, sodium, magnesium, aluminum, silicon, and sulfur. This analysis also leads to a determination of the temperature gradient in the transition region from which the temperature profile can be constructed.

Proton Impact Excitation of Helium-like Ions in the Solar Corona. M. BLANA, NAS-NRC Resident Research Associate, Laboratory for Solar Physics, NASA, Goddard Space Flight Center, Greenbelt, Md. - Electron densities derived from the observed lines of highly ionized He-like ions in the solar corona are inversely proportional to the excitation rate of the 1s2p4s - 1s2p3P transition (Gabriel and Jordan 1969, M.N.R.A.S.)