events are associated with surges and eruptive prominences of moderate sizes. In a morphological classification, rapidly expanding coronal arches and fast coronal material — which open coronal regions — are accompanied by metric II-IV and centimeter radio bursts.

Work performed as a visitor to the Sacramento Peak Observatory.

17. Test for Planetary Influence on Solar Activity. L. A. DINGLE and G. VAN DEVEN, Univ. of Calif., Irvine, and P. A. STURROCK, Stanford Univ. - For many years, there have been persistent but inconclusive claims that planets influence the sun, based on proposed correlations between solar activity and planetary configurations. On the basis of present-day physical knowledge, such an effect seems extremely improbable. For this reason, conclusive demonstration of such an effect would be highly significant.

Striking examples of such correlation have been given by R. H. Bigg and P. S. McNab (Proc. Astr. Soc. Aust., 1, 13, 1967). They show, by superposed-epoch analysis, that there is an apparent correlation between both sunspot number and solar flare frequency and tidal distortion of the sun by the planets. As an independent test of this hypothesis, we decided to repeat an analysis made by A. Schuster in 1915 (Roy. Soc. Proc., 85, 209), who found that sunspot appearances are distributed non-randomly over the sun, as viewed by a hypothetical observer on Jupiter, Venus or Mercury, in a manner which might be attributed to tidal influence.

In repeating Schuster's work, we have analysed 1119 flares of importance ≥ 2, which occurred during 64 years of solar cycle 19 in longitude, referred to Jupiter and Venus, showing no obvious structure. Hence our work does not confirm the proposal advanced by Schuster. We conclude that the association found by Bigg and McNab is either spurious (non-physical) or due to some mechanism other than tidal influence.

18. Impulsive EUV Spectra of Solar Flares. J. E. Donnelly, (E.A. Environmental Research Laboratories, and L. A. Hall, Air Force Cambridge Research Laboratories. The solar flare of 215 UT March 27, 1967 of Hα importance λ was observed at EUV wavelengths via the OGO-3 satellite with a wavelength scanning mode during several wavelength scans. The time and wavelength dependence of these data were studied in conjunction with Hα, microwave, Hα, soft X-ray and hard X-ray data. The EUV flare spectra are compared with prompt emission from other flares and a quantitative composite spectrum of a flare is presented. Any synchrotron emission in the EUV flare spectrum is negligible. The density of the EUV source region in flares exceeds that in plages or in the quiet sun. The 215 UT March 27, 1967 flare is shown to be a long lasting series of impulsive bursts rather than a slow flare. This series of bursts had two main phases involving different spatial regions of emission that were all located near sunspots. The radiation for these two phases was approximately equal at 2.8 GHz and chromospheric EUV wavelengths but the second phase was much stronger for 10.7 GHz and hard and soft X-rays, which is explained as being caused by a harder spectrum of energetic particles during the second phase.

19. Cinematography of Solar Granulation. R. H. DUNN, G. R. HANN, and G. W. SIMON, Sacramento Peak Observatory, Sunspot, New Mexico - High resolution 35 mm filtergrams have been obtained with the vacuum telescope at Sac Peak, using a 65 cm aperture, a 30 cm image, and a bandpass of 0.5 A in the red continuum. A typical time series consists of 24 exposures taken at 30 second intervals. A movie is then constructed using the best frame from each burst. Included in this presenta-

tion are photographs of "abnormal" granulation, which has lower-than-normal contrast, probably due to the presence of strong magnetic fields in the region.

20. A Multichannel Diode Array for Solar Observations. RICHARD B. DUNN and GLEN K. SPENCER, Sacramento Peak Observatory, APFRL, Sunspot, New Mexico - A 256-channel diode array has been added to the spectrograph of the Vacuum Tower Telescope at Sacramento Peak Observatory for the purpose of making photoelectric measurements of wavelengths, magnetic fields and Doppler fields in the solar photosphere. Each channel, consisting of a field lens, a photodiode, amplifier and active filter network, is sampled by an analog-to-digital converter on a Sigma 3 computer. An auxiliary optical system magnifies the field lens on each diode so that areas of 1/2, 1 and 2 seconds of arc. The 256 diodes are divided electrically into groups of 16 and mechanically into groups of 32 so that the array may be set up on different spectral lines, allowing simultaneous measurements. This array will be enlarged to 512 channels this year. Signal-to-noise measurements are shown as well as the functional elements of the system.

21. Development of Solar Active Regions. A. K. DIPRÉ and D. J. BECHIS, Harvard College Observatory - Several solar active regions are studied during their passage across the disk in August - December 1969. The extreme ultraviolet (EUV) spectroheliograms and spectra used in these time development studies were obtained by the Harvard College Observatory experiment on OSO-6. Several regions show increasing activity and subsequent decay. Time dependent changes in line intensities and the parameters of the transition region and corona, (temperature, temperature gradient, conductive flux, and electron density) are determined and compared with corresponding variations in the 9.1 cm radio flux, the Ca II plage area, the number of Hα flares, and the X-ray emission from individual regions.

22. On the Energies and Momentum Balance of Pole-equator Temperature Differences in the Sun. B. R. Dunney, Natl. Cent. for Atmos. Res. - It is suggested that, as a consequence of the action of magnetic fields, the acoustic energy heating the chromosphere, could be deposited at different heights from the equator and at the poles. The result of the equator difference in pressure can be balanced by tilted sinusoidal motions (in the r,θ plane) having some resemblance to horizontal Rossby waves.

23. Measurements of the Solar Brightness Temperature in the Far Infrared. J. A. Eddy, R. L. Lee, E. M. MacQueen, and G. G. Mankin, High Altitude Observatory, Boulder, Colorado. - The solar brightness temperature has been determined in the region from 200 μ to 700 μ wavelength, sampling the low chromosphere from the temperature minimum through the region of initial temperature rise. (10^15 - 10^13 to 10^12). Over much of this wavelength range the brightness temperature has been measured before. Our results were obtained from radiometric spectra of the solar disk, taken in a series of high-altitude aircraft flights in October 1971. The results are compared with previous far-infrared and millimeter measurements, and temperatures derived for the same region by other means, and with existing models of the low chromosphere.