radio wavelengths has, in the past, been interpreted as implying an increasing temperature with depth. However, this effect may have a nonthermal origin, since the 10-cm radiation from Saturn is strongly polarized (Rose, W. K., Bologna, J. M., and Solanaker, R. M., *Astron. J.* **68**, 78, 1963). Therefore, neither a greenhouse effect nor internal heating are required to explain the most recent data. The radiative heat balance of the rings and the emission from a shadowed portion of the disk remain to be determined.

The observed intensity ratios of Saturn to α Her and Jupiter to α Her are 0.117 and 4.22, respectively. If we take the disk temperature of Jupiter to be $126 \pm 2.0^\circ\text{K}$ as implied by the central temperature and limb darkening reported by Murray and Wildey (*Astrophys. J.*, to be published), the disk temperature of Saturn is $93 \pm 3.0^\circ\text{K}$. The observational errors for both Jupiter and Saturn are included.

The measurements were made on 8 and 9 July 1963 at the Cassegrain focus of the 82-in. McDonald telescope, using a dual beam 8 to 14 μ photometer developed by H. L. Johnson and the author.

Observation of a Moving Type-IV Solar Emission Region at 26.3 Mc/sec. H. H. MALITSON AND J. K. ALEXANDER, *Goddard Space Flight Center*, AND W. C. ERICKSON, *University of Maryland*.—Analysis of observations of the sun with the 26.3 Mc/sec array of the Clark Lake Radio Observatory during the summer of 1963 has yielded measurements of the position, size and motion of the emission region associated with McMath plage region 6909. In particular, study of the Type-IV flare-associated event of 11 August shows an outward motion of the radio source through the corona from an apparent altitude of 1.3 to 3.5 solar radii, with a maximum apparent east-west velocity of about 900 km/sec. The initial high-velocity motion was followed by continued outward motion at about 200 km/sec, lasting about one-half hour. This motion, in turn, was followed by a half hour during which the position of the source was stable at about 2.8 solar radii.

The source appeared to consist of an intense core with a half-width smaller than $10'$ surrounded by a fainter halo with half-width about $28'$. At the beginning of the event, the center of the halo was about 0.6 solar radii west of the center of the core, making the apparent shape of the source asymmetrical. The halo then drifted eastward with respect to the core, passing through a stage when the centers coincided, and then to a displacement of about 0.5 solar radii in the other direction. The direction of asymmetry reversed once again near the end of the event. The various stages of asymmetry of the

source appear to coincide in time with the different values of the observed outward velocity.

Comparison with observations by other workers of the characteristics of Type-IV events at higher frequencies shows that this event does not differ markedly at 26.3 Mc/sec from those observed previously over the frequency range 40–169 Mc/sec.

Excitation of Fe XIII in the Corona. J. M. MALVILLE, *The University of Michigan*.—The intensities of the lines, $\lambda 10747$ and $\lambda 10798$, of FeXIII are investigated in calculations in which the excited configurations, $3s3p^3$ and $3s^33p3d$, are included. The most uncertain parameters of the problem are the excitation cross sections of the levels of the ground configuration, and these cross sections are left as unspecified variables. The intensity ratios of the infrared lines are estimated over the following range of the effective collision parameter: $0.01 < \Omega(^3P_0, ^3P_1) < 10$. Observations of the intensity ratio and of the appropriate electron density in the corona lead directly to a measurement of the excitation cross sections of Fe XIII.

Stochastic Model of the Formation and Survival of Lunar Craters. ALLAN H. MARCUS (introduced by J. Neyman), *University of California, Berkeley*.—A lunar crater is called "clean" if its perimeter is not damaged by other craters. Let A denote an area on the moon which, at time $t=0$, was free from craters, perhaps the inside of a crater which formed at that moment obliterating all earlier craters. The subject of study is $\xi(x;t)dx$, the expected number of clean craters per unit area in A at time $t>0$ whose diameters are between x and $x+dx$. The basic model is based on the assumptions: (i) The number of craters created in A between t and $t+h$ (at t , for short) is a Poisson variable with expectation $Af(t)h$, independent of all other variables of the system. The function f is called the feeding function. (ii) New craters created at t are Poisson-distributed over the surface of the moon. (iii) The diameter X of a crater created at t has probability-density $p(x;t)$ called the underlying distribution of X . (iv) A crater is a perfectly circular object whose arrival totally destroys everything within its perimeter, and leaves everything outside intact.

Under these assumptions,

$$\partial \xi(x;t) / \partial t = f(t) [p(x;t) - \mu(x;t) \xi(x;t)],$$

where $\mu(x;t)$ = (the rate at which x -sized craters are damaged at time t) is computable from the model. This equation is easily solved explicitly for $\xi(x;t)$. When $p(x;t)$ is independent of time, $\xi(x;t)$ has an easily computable limit as $t \rightarrow \infty$. The subjects of