Wilson and Palomar Observatories, where one of the authors (G. J. O.) was a guest investigator. The other author is most grateful to Dr. R. M. Petrie for making the summer employment (1963, 1964) possible, and to the Astronomy Department of University of Pennsylvania.

Observations of the Chromospheric K Line Obtained during the 1963-64 Eclipse of ζ Aurigae.

G. J. ODGERS AND K. O. WRIGHT, *Dominion Astrophysical Observatory*.—The chromospheric K line was observed with the 32-in. camera at the Coudé focus of the 48-in. telescope (dispersion 6 Å/mm) on all possible occasions during the recent eclipse with the object of detecting mass motions in the atmosphere of the giant K star. Poor weather prevented observation of the B star's transit behind the outer chromosphere on both ingress and egress. By obtaining several observations during a night it was possible to detect rapid changes in the K line and in satellite lines, showing that the chromosphere consists of numerous condensations with high relative speeds. Of equal importance to the presence of satellite lines at K near eclipse have been the changes at K well outside eclipse. The usual structure is made up of a broad emission feature with velocity components of up to 200 km/sec separation with a superimposed central absorption. These features vary markedly with time and can disappear for weeks at a time especially near eclipse.

Further study of these effects is underway.

The Space Distribution of Stars at Galactic Latitude -30° . A. G. DAVIS PHILIP, *University of New Mexico*.—An objective prism survey in Pegasus at $b^{\text{II}} = -29^\circ$, $l^{\text{II}} = 76^\circ$, in a 33.2 square degree region has been undertaken to determine the space density function and the luminosity function for stars at intermediate galactic latitudes. This work is part of a larger survey which will provide the basis for a cross-sectional study of the galactic spiral arm in the Cygnus direction. The objective prism employed has a dispersion of 280 Å/mm at H_γ . For stars later than G0, luminosity classes I, III, and V can be distinguished. The survey is complete to a B magnitude of 12.2.

A photoelectric sequence of 86 stars was observed at Kitt Peak National Observatory and McDonald Observatory to provide photometric standards in the *UBV* system for the calibration of *B* magnitudes and the determination of interstellar absorption. In the first kiloparsec, the absorption was 0.66 mag. in the blue and 0.50 in the visual.

The space density of main sequence stars earlier than class G0 falls off rapidly with increasing dis-

tance. At 600 pc from the sun it has fallen to 0.1 of the density at 200 pc. G dwarf stars were found to have a constant density to the depth of the survey. The space density of late-type giant stars at 600 pc is about 0.5 that at 200 pc. The luminosity function at 200 and 400 pc, equivalent to a distance of 100 and 200 pc below the plane of the galaxy, shows a dip at $M_B = 2.5$ relative to the shape of the van Rhijn luminosity function of the solar neighborhood.

Polarization of Thermal Emission from Venus.

J. B. POLLACK, *Harvard College Observatory* AND C. SAGAN, *Harvard College Observatory and Smithsonian Astrophysical Observatory*.—Thermal emission from a specific locale on a planetary surface is, in general, polarized, because the emissivities parallel to and perpendicular to the plane of incidence are unequal. A radio telescope unable to resolve the planet will observe a net polarization in the thermal emission for appropriate asymmetries in the surface distribution of temperature T or dielectric constant ϵ . Illustrative calculations indicate that the integrated polarization of the 3-cm radiation from Venus is probably between 0.35% and 2%, which is close to or slightly below the capability of existing radio telescopes. A possibly more promising method of determining the polarization of Venus radio emission is provided by interferometry. Under certain, probably valid, approximations, a complete set of observations with one-dimensional resolution across the planetary disk can obtain the two-dimensional distribution of ϵ and T across the disk, and the obliquity of the axis of rotation. The observed integrated brightness temperature phase effect requires a surface temperature difference between subsolar and antisolar point $\cong 400$ K°. An analysis is made of the incomplete set of interferometric observations of Venus obtained at Owens Valley Radio Observatory by Clark and Spencer (1963). These observations are shown to be consistent with the radar reflectivity and microwave phase effect of Venus if the surface temperature varies markedly ($\cong 500$ K°) between the subsolar point and the pole.

On Luminosity Distances in Selected Model Universes. R. C. ROEDER, *University of Toronto*.—

Graphs showing the time dependence of luminosity distances in certain relativistic model universes have been drawn on the basis of computations using an IBM 1620. The curves clearly show that, as a result of the existence of a particle horizon, which was used by Milne as one basis for his arguments against the relativistic models, this type of distance is not necessarily increasing even though the model is expanding. Since the luminosity distance can be expressed in