374, 1967) have observed the positions of 25 galactic x-ray sources in the quadrants centered at $l^{\text{II}}=0^\circ$ and $l^{\text{II}}=90^\circ$ and their flux density S in counts $\text{cm}^{-2} \text{sec}^{-1}$ per 1–10 Å passband to a reliable lower limit of about 0.18 unit. We show that only one of four proposed distributions of sources is satisfactory. (1) Suppose that sources of $S \geq 0.18$ are equally bright intrinsically and lie randomly in the galactic plane. $S \propto r^{-2}$, where r is the distance from the sun, and the sources for which $S < 0.18$ are too distant to be detected. Then, contrary to the hypothesis, there is a four-fold excess of sources in the range $0.72 \leq S \leq 2.88$, and all eight sources of $S > 1$ lie within $342^\circ \leq l^{\text{II}} \leq 17^\circ$. (2) Suppose that sources are distributed throughout the Galaxy in accordance with the density gradient $\partial \log \nu / \partial R = -0.18 / \text{kpc}$, which holds for novae in the solar neighborhood. Then the nearby (e.g., $r \leq 2$ kpc) bright sources would contribute a negligible fraction (e.g., 1%) of the flux density of all sources near the direction of the galactic center, contrary to the observed source statistics and the isotropic background. (3) Suppose that sources are randomly strung on the H I arm of the Galaxy next interior to the sun, which has an observed radius $R_0 \sin 50^\circ$. If the flux density of a bright source on the arm at $l^{\text{II}}=0^\circ$ is defined to be $S > 0.72$, the position on the arm where the flux density of sources like it drops to $S \geq 0.18$ determines the expected sources in the range $17^\circ < l^{\text{II}} \leq 50^\circ$. The expected number is more than seven times the observed number. (4) There remains undisproven the hypothesis of a cluster of a few intrinsically bright sources around the nucleus of the Galaxy, with another system of intrinsically fainter "field" sources detectable near the sun (Johnson, H. M., *Astrophys. J.* **143**, 261, 1966).

Photoelectric Scanner Spectrophotometry of Sco X-1. H. M. JOHNSON, H. SPINRAD, B. J. TAYLOR, AND M. PEIMBERT, *Lockheed Missiles and Space Co. and Berkeley Astronomy Department*.—The x-ray source Sco X-1 has been observed with the scanner at the 120-in. telescope of the Lick Observatory on 17 February and 8 and 9 March 1967. Sample wavelength intervals of 16, 32, or 96 Å were taken at selected wavelengths in the continuum from 3200 to 7400 Å, and above the continuum at H α , He I 5876, C III 5696, H β , He II 4686, N III 4641, H γ , and H δ +N III, to an accuracy of about ± 0.03 mag. Interstellar Na I 5890-96 was also observed in absorption. Comparison observations of some of Oke's standard stars permit us to reduce the data to absolute units outside the earth's atmosphere. The continuum appears to be bremsstrahlung whose slope, $dm/d(1/\lambda) = 0.25 \text{ mag } \mu$, may be determined principally by interstellar reddening. The slope stays about the same as the intensity changes in an

observed range of about 0.2 mag. Significant upper limits on the Balmer jump and on hypothetical blackbody distortions of linear $m(1/\lambda)$ (bremsstrahlung) can be set. The Balmer decrement is slow and probably indicates radiative excitation. The absolute strength of H α changed by a factor of 4 in 24 h. In general the behavior of the emission features with respect to the continuum and to each other is not simple. However, the inferred He/H ratio is apparently large.

Thermal Emission of Interplanetary Dust Cloud Models. C. KAISER, *High Altitude Observatory*.—A method is described for computing the thermal emission of the interplanetary dust material. Processes specifically included in these models are the optics and thermodynamics of the dust particles, the Poynting-Robertson effect and the physics of sublimation, while the effects of the coronal gas and the solar wind are neglected. Special attention is given to the variation of the temperature with particle size and the influence of sublimation on the space and size distribution of particles near the sun. Models are constructed for a well-known substance to show the qualitative features of the thermal emission, and the procedure is then reversed to deduce some properties of the interplanetary dust material from recent observations.

Six-cm Radio Radiation from Planetary Nebulae. MAE A. KAFTAN-KASSIM, *Dudley Observatory and the State University of New York at Albany*.—Flux density measurements of Planetary nebulae at 6 cm have been made at the National Radio Astronomy Observatory using the 140-ft radio telescope at Green Bank. Sixty planetary nebulae were detected, the limit of detection being 0.05 flux units (one flux unit = $10^{-26} \text{ W m}^{-2} \text{ Hz}^{-1}$).

The 6-cm fluxes are combined with measurements at other wavelengths made both at Green Bank and elsewhere and the resulting spectra are discussed. Most objects exhibit a thermal spectrum. Five objects show possible nonthermal spectra. These may be explained by possible chance coincidences. One of these, however, NGC 40, seems to consist of a thermal plus a nonthermal source, the latter slightly removed in position, similar to the sources observed near NGC 3242 (M. A. Kaftan-Kassim, *Astrophys. J.* **145**, 658, 1966). There are other observations that indicate that a few other planetary nebulae have such companion nonthermal sources (Kaftan-Kassim, to be published). Analysis of further records as well as the securing of more observations will decide whether or not this is a true physical association or a mere chance coincidence.