University of Michigan show the presence of emission in the three known Be stars but fail to show it for the other stars. The objective prism method is preferable to the slit method for the discovery of H α -emission stars in H II regions. Upon similar 10° plates three new Be stars were discovered in each of the clusters NGC 7654 and NG 2421; the number of Be stars in the former cluster is thus six. *UBV* photometry of the Be stars and brighter members of NGC 2421 was recently carried out at the Cerro Tololo Inter-American Observatory. A search program for Be stars in clusters containing B stars is described.

Infrared Observations of the Outer Solar Corona.

R. M. MACQUEEN, *The Johns Hopkins University*.—The 2.2 μ infrared coronal radiance has been measured with a ground-based telescope during the total solar eclipse of 12 November 1966 from $2R_{\odot}$ to $6R_{\odot}$, and during a stratospheric balloon flight of a coronagraph, from $3.7R_{\odot}$ to $10R_{\odot}$. Features superposed on a continuum corona at $3.5R_{\odot}$ and $4.0R_{\odot}$ were observed in the former circumstances, and features at $4.0R_{\odot}$, $8.7R_{\odot}$, and $9.25R_{\odot}$ noted from the latter measurements. Isophotes of the continuum corona obtained from the balloon flight data show a peak displaced from the ecliptic, and closely coinciding with the invariable plane of the solar system. The experiments are discussed, and the observations are presented, and compared with a model of thermal emission of circumsolar dust.

Restrictions on the Mechanism for Optical Emission from Sco X-1. OSCAR P. MANLEY, *American Science and Engineering, Inc.*—Shklovskii, in a private communication, pointed out that the widely held hypothesis of thermal bremsstrahlung emission from Sco X-1 is contradicted by the observed color changes as the visual magnitude fluctuates: the thermal bremsstrahlung spectrum is a monotonically decreasing function of frequency, which does not admit the observed vagaries of the color indices. Such a limitation does not appear to apply to the optical portion of the synchrotron emission from hard electron spectra.

The results of recent observations of Sco X-1 are discussed in the light of the preceding.

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Lightweight Aluminum Mirrors for Astronomical Telescopes. STEPHEN P. MARAN, *Kitt Peak National Observatory*.—A 50-in. mirror and support bracket, designed by F. E. Stuart and M. D. Larson, were installed in the Remotely Controlled Telescope in

1965. The mirror and support are both aluminum, and weigh 430 and 310 lb, respectively. The former is 0.25 in. thick at the edge. Initial warm-weather tests showed that the image was seeing-limited, at least for telescope orientations between the zenith and 30° altitude. During cold weather, the mirror deforms slightly, so that we must mask it in order to perform accurate *UBV* photometry. This effect is attributed to the different thermal expansion coefficients of the aluminum mirror casting and its Kanigen coating; the relevant theory has now been published (Barnes, W. P., *Applied Opt.* **5**, 701, 1966). The coating was originally 0.007 in. thick; however, 0.003 in. was removed from the front surface in the figuring process. Two more astronomical telescopes, both engaged in infrared photometry, employ mirror/support-bracket systems adapted from the KPNO design. They are the 24-in. ITT Federal Laboratories instrument, located at Mount John University Observatory in New Zealand, and a 60-in. reflector at the Catalina Station of the Lunar and Planetary Laboratory, University of Arizona. The Kanigen process was not developed with the specific and critical requirements of astronomers in mind. It seems highly desirable that further metallurgical research be undertaken, in order to obtain improved thermal behavior in future lightweight aluminum mirrors, because the great savings in weight afforded by these mirrors can lead to major reductions in costs of the telescope mounts and thus to more aperture per dollar.

Formation of Planets by Accretion of Planetesimals; Some Statistical Problems. ALLAN H. MARCUS, *Case Institute of Technology*.—We consider some consequences of the hypothesis that planets are formed by the accretion or accumulation of roughly lunar-sized planetesimals. Stochastic coalescence theory predicts that the frequency distribution of masses of the planetesimals is approximately an inverse power law with index α , $0 < \alpha < 1$ (usually $\alpha = \frac{1}{2}$). The average mass of the planetary nucleus (largest planetesimal) is 0.60 the mass of the final planet, and the average mass of the largest planetesimal colliding with the nucleus (the second largest planetesimal) is about 0.20 planetary masses. Some other facts about the distribution of relative sizes of the largest planetesimals are also derived.

The distribution of change in rotational angular momentum components as a result of the accumulation of planetesimals with random masses, velocities and directions is also derived. This distribution is used to show that the discrepancy between our estimate of the relative mass of the second largest planetesimal and Safronov's estimate (10^{-3} to 10^{-2} planetary masses) is due to the relatively high collision speeds his model requires.