The initial development and subsequent tests of this equipment were made possible by a NASA grant to the Lowell Observatory.

On the Fission Theory of the Origin of Binary Stars. IAN W. ROXBURGH, *High Altitude Observatory*.—The pre-main sequence evolution of a rotating nonmagnetic star is investigated and it is found that rotational instability will occur in the central regions of the star during the development of a radiative core, provided that the total mass exceeds $0.8M_{\odot}$. This is imagined to give rise to the splitting of the central regions and the formation of a binary system. A discussion of the angular momentum of the objects predicts that for a total mass between $0.8M_{\odot}$ and $4.0M_{\odot}$ the end product should be a contact configuration of the W Ursae Majoris type. For larger masses the star must form a separated binary system. The predicted distribution of angular momentum with mass is in good agreement with observations of W Ursae Majoris systems.

Thermal Enhancements on Rayed Craters, Bright Spots and Maria as Revealed by Infrared Scanning of the Lunar Disk during the Total Eclipse of 19 December 1964. R. W. SHORTHILL AND J. M. SAARI, *Boeing Scientific Research Laboratories*.—A focal-plane scanner mounted on the 74-in. Kottamia telescope of the Helwan Observatory in Egypt was used to scan the entire lunar disk in the infrared. Using a mercury-doped germanium detector cooled with liquid neon, we could scan the disk in 16 min with 200 successive traverses. Scans were made four times during the first penumbral phase, three times during totality and once during the second penumbral phase. Several scans were also made on the full moon just previous to the eclipse.

As expected from previous work, the major ray craters cooled less rapidly than their environs. Unexpectedly, however, hundreds of localized "hot spots" were discovered. Many of these hot spots showed only on one traverse, indicating sources the size of the detector resolution (10 sec of arc) or smaller. Some of these have been identified with small bright areas which dot the seas and uplands.

In addition to the hot spots, thermal enhancements were found over extended areas of several seas. Notable among these is Mare Humorum, all of which was thermally elevated above its surroundings.

Thermal contour maps are being plotted and will be compared with surface features. Cooling curves for specific areas will be constructed and compared with theoretical cooling curves for different models of the lunar surface.

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Some Characteristic Properties of Solar Magnetic Fields. SARA F. SMITH AND HARRY E. RAMSEY, *Solar Physics Laboratory, Lockheed-California Company*, AND ROBERT HOWARD, *Mt. Wilson and Palomar Observatories*.—A two-year project in reducing and analyzing the Mt. Wilson magnetograms has led to increased knowledge about the properties of solar magnetic fields. It is now recognized that all solar magnetic fields are basically bipolar units or products of bipolar units. These bipolar units (or sometimes multipolar units) are the magnetic fields of active regions. As the active regions age, their magnetic fields expand and weaken (as measured with the 23 sec of arc resolution of the magnetograph), and gradually merge into a large slowly changing pattern of weak background fields.

Some chromospheric phenomena such as flares and filaments exhibit a generally consistent pattern with respect to the photospheric magnetic field configuration. Both flares and filaments in strong magnetic regions appear to be related to the neutral line between opposite polarities. Filaments, both inside and outside of active regions, are located, almost without exception, along neutral lines of the longitudinal magnetic field. Occasionally a complicated configuration of polarities will result in an active region filament apparently crossing photospheric isogauss lines. We believe this to be a height effect; the neutral line may exist above the photosphere.

Of 21 flares of importance 1 or greater observed on 15 days, all were found to lie adjacent to a neutral line, as closely as could be determined within the accuracy of the isogauss maps and the method of overlaying flare positions on these maps of photospheric magnetic fields. In most situations where the flare consisted of more than one segment, these segments lay on both sides of the neutral line and occasionally extended across the neutral line. In some cases, the flare segments extended into areas of weak magnetic field but maintained their general orientation with respect to the neutral line.

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Radio Measurements of Venus near 1-cm Wavelength. D. H. STAELIN AND A. H. BARRETT, *Massachusetts Institute of Technology*.—During June and July 1964, measurements of Venus were