Interferometer for Astronomical Infrared Spectroscopy. WILLIAM M. SINTON AND PETER B. BOYCE, *Lowell Observatory*.—Two-beam interferometry, such as that which occurs in a Michelson mirror interferometer, was first employed for infrared spectroscopy by Rubens and Wood (*Phil. Mag.* **21**, 249, 1911). It has been shown theoretically by Fellgett that a considerable gain in single-to-noise ratio compared to conventional infrared spectroscopy should be obtained (P. Fellgett, *J. Phys. Radium* **19**, 187, 1958). An interferometer utilizing birefringent optics has been described by Mertz (L. Mertz, *J. Phys. Radium* **19**, 233, 1958).

The interferometer employed here is similar to that of Mertz but has several important improvements. Fluctuations caused by atmospheric transparency changes, scintillation, and seeing are compensated. Synthetic rutile crystals (titanium dioxide) are used because of their large birefringence and good infrared transparency. The observations are digitally recorded so that they may be readily processed by a large digital computer to carry out the Fourier transform necessary in obtaining the spectrum. The interferometer is used in the region of reciprocal wavelengths of 2500 to 5500 cm^{-1} ($4\ \mu$ to $1.8\ \mu$) and it provides a resolution of 20 cm^{-1} . The theoretical gain in signal-to-noise is $N^{1/2}$, where N is the number of resolution elements into which the spectrum is divided. In this instance the gain is $[(5550-2500)/20]^{1/2}=12.4$. A practical gain of this order is demonstrated in a spectrum of R Lyr obtained with the Perkins 69-in. reflector of the Ohio Wesleyan and Ohio State Universities at the Lowell Observatory. The interferometer has been used for astronomical observations during the past $1\frac{1}{2}$ years and was built with the aid of two grants from the Research Corporation.

Precision Radio-Astronomical Antenna for Millimeter Wavelength Observations. JOSEPH M. STACEY AND EUGENE E. EPSTEIN, *Aerospace Corporation*.—The Space Radio Systems Facility of Aerospace Corporation is equipped with an equatorially mounted, 15-ft diam. antenna. The reflector consists of a welded and machined aluminum surface. The rms surface deviations are ± 0.0036 in., permitting operation down to $\lambda = 1$ mm (300 Gc/sec). The system is now in operation at $\lambda = 3.2$ mm (94 Gc/sec), the approximate wavelength of the minimum between the atmospheric O_2 and H_2O absorption bands. The half-power beamwidth and gain at this wavelength are 2.9 min of arc and 70 dB, respectively. The antenna is programmed in real time by a digital servo loop using an SDS-920 computer. The computer makes pointing corrections for refraction, mount tilt, etc., and includes ephemeris-controlled tracking of solar-system

objects. The computer is also used to execute automatic observing programs and provide real-time data reduction.

This research has been supported by U. S. Air Force Contract No. AF 04(695)-269.

Ultraviolet Spectrophotometry of Early-Type Stars. THEODORE P. STECHER, *Goddard Space Flight Center*.—The observations obtained by two rockets on stars in the summer sky are reported. The instrumentation used was similar to that previously reported by Stecher and Milligan (*Astrophys. J.* **136**, 1, 1962). The spectral range has been increased to a short-wavelength limit of 1250 Å. The spectral energy distribution of the stars is compared with a grid of model atmospheres recently computed by Mihalas and various other investigators. On the basis of the pre-flight calibration and with a surface gravity of $\log g = 4$, a temperature scale is provisionally assigned to the B stars on the basis of flux ratios between the visible and ultraviolet. This temperature scale gives around 25 000°K to the B0 stars and is in good agreement with recent ground based observational determinations in the A stars. An extension of the λ^{-1} law appears to give a reasonable approximation to interstellar extinction but is not sufficient at $\lambda 2200$.

A single spectrum of Jupiter was obtained in the $\lambda\lambda 2000$ –3000 region. When the reflectivity is interpreted as Rayleigh and Raman scattering, an upper limit of 12 km atm of H_2 is derived. This is under the assumption of all H_2 and a ground reflectivity of zero. Any ground reflectivity or He in the atmosphere will reduce the amount of H_2 .

The spectrum of the night airglow was obtained between $\lambda 1250$ –3500. The total flux is less than 1200 Rayleighs of which 1000 Rayleighs is in the Herzberg O_2 bands.

Lockheed Lunar Observing Program. LAURANCE G. STODDARD, *Lockheed-California Company*.—The Lockheed-California Company has acquired lunar observing time on the new Stony Ridge 30-in. reflector. This new telescope is located in the San Gabriel mountains of Southern California six miles northeast of Mt. Wilson.

The lunar work that presently is being undertaken is of a photographic nature. A special lunar camera has been designed and built that employs 70-mm film and is used at the Cassegrainian focus of the instrument. This camera is designed with exposure capabilities from 1/256 sec in steps of two to 2 sec as well as time exposures. It employs a rotating balanced shutter to minimize vibration.

The main program at the present time consists