A Preliminary Study of the Orbits of Merit for Moon Probe. SU-SHU HUANG, *Goddard Space Flight Center*.—Ideal orbits of the space vehicle for moon probe have been studied preliminary under the approximation implied in the restricted three-body problem by the method of successive approximation carried out on the IBM 7090 digital computer. It has been found that it is possible to find orbits on which the space vehicle can encircle both the earth and the moon at reasonable distances for a period of a few years or more. A detailed procedure for deriving such orbits has been given and, as examples, a few orbits of such nature have been obtained.

On the Equilibrium of Sodium in the Solar Atmosphere. HOLLIS R. JOHNSON, *Yale University Observatory*.—An empirical method for studying departures from LTE (local thermodynamic equilibrium), based on central intensities and equivalent widths of Fraunhofer lines, has been applied to neutral sodium in the solar photosphere. Excitation temperatures at various depths were obtained by inverting the intensity integrals for 16 unblended lines of *NaI*. These excitation temperatures were located in depth relative to a known scale, say τ_{5000} , by adoption of the model atmosphere previously used by the Paris Observatory group, which is compounded of the Minnaert photospheric model and the High Altitude Observatory low-chromospheric model. Two different turbulence models were used. Departures from LTE were found by comparing excitation temperatures with the electron temperatures in the model. Effects of these departures on the abundance were investigated by using excitation temperatures to recompute equivalent widths and then obtaining a new abundance by comparing these with observation. A self-consistent solution for both the departures from LTE and the abundance was obtained by iteration.

Excitation temperatures of *NaI* outline a smooth curve as a function of depth but differ from electron temperatures by amounts up to 400° right in the photosphere. These differences are in the sense that $T_{ex} < T_e$ for $\tau_{5000} < 10^{-2}$ and $T_{ex} > T_e$ for $10^{-2} < \tau_{5000} < 1$. A first-order non-LTE calculation of the abundance yields a value about 1.5 times that obtained by Goldberg, Muller, and Aller in the latest conventional treatment. This factor may be within the observational and computational uncertainties of the problem. We conclude that the distribution function of *NaI* departs considerably from the Boltzmann distribution, but inclusion of this effect does not markedly change the abundance determined on the conventional assumption of LTE.

Problems of Rapid Interchange of Solar-Geophysical Data. J. VIRGINIA LINCOLN, *National Bureau of Standards*.—Very rapid reporting of solar observations, both by optical and radio means, and of associated geophysical phenomena is required today to satisfy the needs of many scientists; in particular, those dealing with space science. The present status of such data interchange on both worldwide and hemispheric basis will be discussed. This interchange is operated through the World Warning Agency at the National Bureau of Standards North Atlantic Radio Warning Service, Ft. Belvoir, Virginia. Future needs will be discussed. Among them is the continuing need for solar flare patrol programs as well as the development of improved communication facilities.

Preliminary Orbital Elements of the Spectroscopic Triple HD 157978–9. DEAN B. McLAUGHLIN, *The Observatory, University of Michigan*.—The triple nature of this star was announced by the author (McLaughlin, D. B., *Astrophys. J.* **105**, 497, 1947). The brightest component is a class G giant. The other two are of class A0 and are practically equal in luminosity and mass. The orbital period of the A-star pair is about 3.76 days. This pair and the G star revolve about the center of mass of the system in 1170 days.

The observational material includes 120 Michigan spectrograms, 1946 to 1955, 19 Mt. Wilson plates taken in 1947, and 22 Victoria plates taken in 1955. Grateful acknowledgment is made to O. C. Wilson and R. M. Petrie, respectively.

Orbital elements are as follows:

Long-period orbit; G star and A pair

$$P = 1170 \text{ days}$$

$$\gamma = -12.1 \text{ km/sec}$$

$$K_G = 27.0 \text{ km/sec}$$

$$K_{2A} = 19.5 \text{ km/sec}$$

$$e = 0.445$$

$$\omega_G = 222^\circ.3$$

$$\omega_{2A} = 42^\circ.3$$

$$T = \text{JD } 2433085$$

$$(\text{periastron})$$

$$a_G \sin i = 3.88 \times 10^8 \text{ km}$$

$$a_{2A} \sin i = 2.80 \times 10^8 \text{ km}$$

$$m_G \sin^3 i = 3.65 \odot$$

$$m_{2A} \sin^3 i = 5.05 \odot.$$

Short-period orbit of A pair

$$P = 3.75805 \text{ days}$$

$$K_1 = K_2 = 110 \text{ km/sec}$$

$$e = 0.00$$

$$T_0 = \text{JD } 2432019.570 \quad (\text{conjunction})$$

$$a_1 \sin i = a_2 \sin i = 5.68 \times 10^6 \text{ km}$$

$$m_1 \sin^3 i = m_2 \sin^3 i = 2.06 \odot.$$