Relative Abundances in the High Velocity Star HD 25329. ARNOLD M. HEISER, *Yerkes Observatory*.—A curve-of-growth analysis is used to determine the abundances in HD 25329, a high-velocity K1V star, relative to the normal dwarf 70 Oph A (K0V). If plausible values for the necessary physical quantities are assumed, then certain elements are underabundant by factors of 200 to 1000 in HD 25329 relative to 70 Oph A. These results are compared with various relative abundance determinations in other high-velocity stars.

A Color-Magnitude Diagram for a Portion of the Large Magellanic Cloud. PAUL W. HODGE, *Harvard College Observatory and Smithsonian Astrophysical Observatory*.—Measures of 1000 stars in a section of the northern part of the Large Magellanic Cloud have provided a color-magnitude diagram for the field stars of the region. Photographic measures were calibrated by a photoelectric sequence obtained by Arp. The survey in the section studied was complete to $V=17.5$.

The resulting diagram shows a populous main sequence which accounts for about half of the stars. The remainder lie in the giant and supergiant area, forming two broad sequences, one intermediate in color and one very red, as well as a normal giant branch similar to those of nearby globular clusters. The location of stars in the evolved part of the diagram is unlike that for Milky Way stars, as determined by galactic clusters.

Forty-four of the 1000 stars are variable in brightness. Five of these are Cepheids, all but one of which have periods of four days. Five are very red irregular variables, two are irregular yellow variables, two are eclipsing binaries, and the remaining 30 form a sequence of peculiar variables with highly unusual properties. Details will be published elsewhere.

Very Restricted Four-Body Problem. SU-SHU HUANG, *Goddard Space Flight Center, National Aeronautics and Space Administration*.—Qualitative behavior of artificial satellites in the earth-moon-sun system has been discussed in terms of a very restricted four-body problem of masses m_1 , m_2 , m_3 , and m such that $m_1 \gg m_2 + m_3 \gg m$. If the separation between m_2 and m_3 is very much smaller than the distance of their center of mass from m_1 , we can first idealize a state of motion (with approximation) of the three bodies m_1 , m_2 , and m_3 in such a way that m_2 and m_3 revolve around each other in circular orbits and furthermore the center of mass O' of m_2 and m_3 revolves around m_1 in a circular orbit too. By choosing a coordinate system with the origin at O' and revolving together with m_2 and m_3 , we derive

an integral which is the counterpart to Jacobi's integral in the restricted three-body problem. The position of m_1 enters into the integral through the angle subtended at O' by m_1 and m . Therefore no stationary zero-velocity surface can be defined in the present problem. However, we can introduce the conception of osculating zero-velocity surfaces which provide the instantaneous limiting surfaces, that m of a given initial condition cannot pass through.

Double points of the zero-velocity surfaces have also been studied. In the restricted three-body problem these points are fixed in the rotating frame of reference and are the solution of the problem. It is not so in the very restricted four-body problem studied here. The double points rotates in the xy plane as m_1 moves with respect to the m_2-m_3 system. A study of the motion of these points leads to an interesting result that under certain conditions depending upon the mass of m_1 and its distance from O' , the critical zero-velocity surfaces which pass through two double points become degenerated into one single surface. On both sides of degeneracy, the zero-velocity surfaces have fundamentally different appearances. It can be shown from these surfaces that any artificial satellite around the moon has to be close, in order to be stable.

Experiment to Determine Accurately the Polarization and Intensity of the Light from the Solar Corona. W. F. HUCH, E. P. NEY, R. W. MAAS, AND P. J. KELLOGG (introduced by MARTIN SCHWARZSCHILD), *University of Minnesota*.—Kellogg and Ney presented a theory that the solar corona may consist of charged particles trapped on a solar magnetic field. In order to test the possibility that synchrotron radiation in the visible might be detected from the solar corona, equipment has been constructed which measures the absolute intensity of polarized and unpolarized light from the corona, at wavelengths of 4500 Å and 8500 Å. It consists essentially of television cameras attached to telescopes, using photomultipliers as detectors. The accuracy of the equipment is such that the absolute intensities of polarized and unpolarized light from the corona may be measured to 5%, and the direction of the polarization angle may be measured to an accuracy of ± 0.8 deg. This equipment was successfully used on two sites in the Sahara Desert to measure the polarization of the corona during the eclipse of October 2, 1959. At each of these two sites, successful data were obtained for five complete scans of the corona in each color of light. Results are presented in the accompanying paper by Ney, Kellogg and Huch (p. 352). This research was supported by the ONR, the NSF, and the NASA.