wavelengths of 3.2 and 9.1 cm, the radio source has a size of about 3 minutes of arc, while at 21 cm it has a size of about 4 minutes of arc. The average height above the photosphere is 19 000 km at 3.2 cm and 27 000 km at 9.1 cm. Flux density of the source associated with a sunspot area of 1000 millionths is about $25 \times 10^{-22} \text{ w m}^{-2} (\text{cps})^{-1}$ at 9.1 cm and about $20 \times 10^{-22} \text{ w m}^{-2} (\text{cps})^{-1}$ at 3.2 cm. For three sources the flux density was appreciably higher at 9.1 cm than at 3.2 cm. This cannot be explained by assuming greater optical depth for the extraordinary wave at 9.1 cm since the degree of polarization seems to be much smaller at 7.5 or 9.1 cm than at 3.2 cm. It is suggested that the increased radiation near 9 cm arises from the resonance absorption at harmonics of gyrofrequency.

Polarization Measurements of Solar Emission at a Wavelength of 9.1 cm. T.KAKINUMA and G. SWARUP, *Radio Astronomy Institute, Stanford University*.—A phase-switched interferometer has been used to measure the polarization of solar radio emission at a wavelength of 9.1 cm. The interferometer provides resolution of about 1.5 minutes of arc and the resulting high-resolution observations show that the north and south pole regions of a bipolar sunspot group give rise to right-handed and left-handed circular polarization, respectively. Contrary to the theory of Piddington, and supporting eclipse observations made in Japan, the sense of polarization remains the same irrespective of the quadrant in which the north or south pole region is located. The results of a comparison made between the 9.1-cm polarization observations made at Stanford and 3.2-cm observations made at Nagoya are also described.

The Structure and CO_2 Content of Venus' Atmosphere. LEWIS D. KAPLAN, *The Rand Corporation and Department of Meteorology, Massachusetts Institute of Technology*.—The Venus spectra of Kuiper and that of Strong and Sinton have been reinterpreted with the aid of laboratory CO_2 absorption measurements by Howard *et al.* and Kostkowski and the results of the Regulus occultation measurements. A self-consistent picture is obtained for the part of the Venus atmosphere above the "effective reflecting level" for near-infrared radiation.

This effective reflecting level is at about 400 mb, and is most likely composed of sand or dust stirred up from the surface. The emission around 10μ is from a thin cloud layer at 90 ± 50 mb, where the temperature is $230 \pm 5^\circ \text{K}$. It may be composed of ice crystals, and is presumably the visible cloud.

The fraction by volume of CO_2 is $15 \pm 7\%$.

A Uniformly Valid Asymptotic Representation for All Times of the Motion of a Satellite in the Vicinity of the Smaller Body in the Restricted Three-Body Problem. JIRAIR K. KEVORKIAN, *Aero/Astrodynamic Section, Douglas Aircraft Company*.—This analysis proceeds from the differential equations governing the restricted three-body problem. The equations are given in nondimensional variables, and contain a small parameter equal to the ratio of the masses of the planet and sun.

Certain concepts originally developed in the study of the asymptotic solutions of fluid-mechanical problems are introduced. In particular, the connection between the solution of an approximate differential equation and the corresponding exact solution is related to the limit process by which the approximate differential equation was obtained from the exact equation.

It is shown that Hill's equations can be derived by such a limit process from the restricted three-body equations. When the motion is confined to a smaller neighborhood of the planet, an analogous limit process exists, and leads to a set of simpler equations for which the intermediate orbit is Keplerian in an inertially oriented frame. These approximate differential equations are transformed to an appropriate coordinate system containing unknown uniform precessions for the node and line of apsides.

It is shown that by requiring the motion to be bounded for all time, one can uniquely define these precessional rates and obtain a uniformly valid asymptotic solution for the motion.

The results obtained for the precessions of the node and perigee agree exactly with those of the classical lunar theories (e.g., de Pontecoulant).

The solutions are only carried out for the case where the inclination of the satellite orbit with respect to the plane of the ecliptic is small. However, the proposed method can readily be generalized to the case of arbitrary inclination.

A Method for Computing Monochromatic Fluxes in Model Stellar Atmospheres. S. S. KUMAR, *Smithsonian Astrophysical Observatory*.—The usual numerical procedures for obtaining accurate monochromatic fluxes for a given model atmosphere are very lengthy. Here is presented an analytical method that is quick and that gives the following simple expression for the monochromatic flux for any frequency and at any optical depth:

$$F_\nu(\tau_\nu) = \sum_i a_i(\nu) \Phi_i, \quad (1)$$

where Φ_i are the known Φ operators of the simple functions like τ_ν^m , $E_n(\tau_\nu)$ and $e^{-d_p \tau_\nu}$. By solving a set of algebraic equations, one obtains the a_i 's. This set of algebraic equations is obtained by assuming