36.05 Radio Observations of 1 Ceres, K.J. JOHNSTON, NRL, P.K. SEIDELMANN, USNO, and C.M. WADE, NRAO - The minor planet 1 Ceres was observed at radio frequencies of 4.9 and 15.0 GHz by the Very Large Array of the National Radio Astronomy Observatory in May 1981. The measured flux density at these frequencies implies a brightness temperature of ∿ 105 K. This brightness temperature is well below that expected from reradiated blackbody radiation from a rapidly rotating body at 1 Ceres distance indicating that its surface may be covered by a thin layer of dust. The position of 1 Ceres was measured relative to the quasars 0839+187 and 0851+202 and was found to agree within -0."2 in right ascension and 0."5 in declination with the predicted position defined by Duncombe's 1969 ephemeris.

36.06 A Comet on Collision Course with the Sun: Observations on August 30-31, 1979, R.A. HOWARD, M.J. KOOMEN, D.J. MICHELS, N.R. SHEELEY, JR., E.O. Hulburt Center for Space Research, NRL.

The NRL SOLWIND coronagraph, in earth-orbit aboard the P78-1 satellite, has been transmitting images of the outer solar corona (2.5 - 10.0 R_o) since March, 1979. Data tapes for the latter part of August, 1979, recently received, revealed a comet-like object in the field of view at 6 R_o elongation. The comet was first observed at 1856 UT on 30 Aug 1979, at position angle SW 35°. Eight subsequent images recorded the comet's progressive motion toward the sun, until the head disappeared behind the coronagraph's occulting disk (elongation 2.5 R_o) at 2115 UT. Later coronagraph images, starting at 2344 on 30 Aug, and continuing throughout 31 Aug, indicate a massive release of cometary material, as evidenced by the brightening of an entire hemisphere of the outer corona. The basic data set and image analysis techniques will be described.

36.07 A Comet on Collision Course with the Sun: Orbital Data Deduced from the Observations of August 30-31, 1979, N.R. SHEELEY, JR., R.A. HOWARD, M.J. KOOMEN, D.J. MICHELS, E.O. Hulburt Center for Space Research, NRL.

We have calculated possible cometary orbits that are consistent with the observations described in the previous paper. Briefly there are eight accurately timed positions of the comet head in the 139 minute interval between 1856 UT and 2115 UT on 30 Aug 1979. Elongations from the sun in this interval varied between 6.0 and 2.5 solar radii (R_o). Picture elements in the images are separated by 1.25 arc minutes center to center. Measured positions in our sun centered plane-of-the-sky coordinate system are accurate to $\pm$0.1 R_o in heliocentric distance and to $\pm$0.25 degrees in position angle, using as a reference the fortuitous prescence of Venus and Regulus in the field of view. The fitting procedure was accomplished by treating as a free parameter the heliocentric distance at perihelion, q, which uniquely determines the form of the parabola in space, then adjusting the view angles and time of perihelion passage to match the observed projected positions as a function of time. Changes in aspect owing to the earth's orbital motion during the brief period of observation were neglected.

The resulting solutions fall into the range $0.12\ R_o \leq q \leq 2.0\ R_o$. Data from later images, recorded after 2344 UT, indicate that the comet collided with the sun ($q < 1.0\ R_o$). There is evidence that this comet may be one of the group of Kreutz sungrazers.

36.08 A Comet on Collision Course with the Sun: Dynamical Interpretation of the Observations of August 30-31, 1979, D.J. MICHELS, N.R. SHEELEY, JR., R.A. HOWARD, M.J. KOOMEN, E.O. Hulburt Center for Space Research, NRL.

The coronagraphic data have been carefully examined for clues that might indicate details of the comet's encounter with the sun. In this paper we discuss the polarization information contained in the images, the changes in the background corona, and we question whether the widespread coronal brightening observed after the projected time of perihelion is caused by material in the orbital plane, or by material that has been driven out of this plane. Two scenarios are presented; the evidence indicates cometary material was widely diffused throughout the corona following collision and disintegration of the comet.

36.09 CO (CO_2) and H_2O Abundances in Comets, S. WYCKOFF, Arizona St. U., P.A. WEHINGER, Arizona St. U., and Northern Arizona U., E. LEIBOWITZ, Tel-Aviv U., T. PITMAN, Arizona St. U. Molecular ion spectra of comets Kobayashi-Berger-Milon (1975 IX) and West (1976 VI) have been analyzed, and those of comet Kohoutek (1973 XII) reanalyzed using improved laboratory data. Estimates are given for both CO^+ and H_2O^+ column densities at projected distances from the nucleus ∿10^4 km. For comet West (1976 VI) monochromatic surface brightness profiles along the plasma tail axis are presented for both CO^+ and H_2O^+ to projected distances from the nucleus ∿3×10^5 km in the solar and anti-solar directions. A significant difference in the CO^+ and H_2O^+ production rates is found for comets with approximately the same heliocentric distances, solar wind conditions and H_2O production rates. The relative H_2O and CO (or CO_2) abundances in the three comets are discussed in the light of current cometary ionospheric models.

36.10 Do Comets Have Satellites?, T.C. Van Flandern, U.S. Nav. Obsy. - The discovery of satellites of minor planets, together with the spectral and reflective similarities between minor planets and comets, lead one to ask the title question. Sphere of influence calculations for cometary nuceli show that the idea is dynamically viable, and certain puzzles of cometary behavior could be easily explained if cometary satellites exist. In particular, it can be argued that components of comets which split are actually cometary satellites which have undergone gravitational escape, rather than fragmentations of the nucleus. Separation velocities of split comets are observed to be inversely proportional to the square root of heliocentric distance, as they must be for grav-