in such a collision, significant increases in the mean can occur in the angular velocity of the largest fragment. Off-axis collisions produce a phenomenon which is rapidly damped by interstellar energy dissipation. The effect of inter-particle collisions on the orbital parameters is briefly discussed and is shown to be masked by selection effects.

09.05.02 The Dust Tail of Comet Seki-Lines, B.J. JANBORG, University of Illinois. - Comet Seki-Lines reached perihelion on April 3, 1962 at a distance of 0.03 A.U. A series of plates taken with a filter which eliminates the gas-ion emission was taken by F.D. Miller at the University of Michigan, and shows clearly the split tail phenomenon. Isophotometric maps of the dust tail were obtained showing relative intensities. The Pinson and Probstein (1965 Astrophys. J. 157, 327) approach was used to investigate the synchronous configuration and relative brightness of the tail. A model which gives a fairly good fit to the isophote map features (1) a sudden increase in the dust release rate near perihelion, followed by a similarly rapid decrease, and finally a slow recovery nearly to the incoming level, and also (2) a size distribution favoring the larger particles with sizes of 30 micron or more. The phenomenon of near perihelion excessive dust production as well as the size distribution of the grains are in accord with the work of Hubble (1970 Astron. & Astrophys. 2, 266). It is suggested that the split dust tails shown by other comets, like Tago-Sato-Komaki, may have a similar cause, one or more consecutive bursts of dust production.

09.06.02 The Quantization of Macroscopic Rotors, J.M. BARNOTH, EVANSTON, ILL.- In 1946 (Nature 157, 808 and 158, 309) I have shown that formally the quantization of macroscopic rotors can be described through the same equations as used for microscopic rotors, provided we write de Broglie's wave equation in the form $\lambda = \hbar k/|p|$ instead of $\lambda = \hbar /|p|$; or by setting the arbitrary constant $K$ in Schrodinger's equation to $2\pi h^2 k^2$ instead of $h^2 r$. Here $k$ is the spin of the orbiting particles (electrons, planets, solar system, galaxies). The constant $a$ has to be set equal to the fine structure constant to be in numerical agreement with observations, and $k$ is an integer less than 10. $k=0$ applies to the atoms; $k=2$ to the outer planets; $k=3$ to the inner planets; $k=6$ and $k=7$ to the solar system and to binary systems, respectively, which revolve around the center of the Galaxy. Applying Pauli's exclusion principle, it was possible to explain why the rotation of Uranus is retrograde, why a planet with the quantum number $n=6$ would have to explode into planetoids and to predict 26 years ago the retrograde rotation of Venus. The possible existence of a tenth planet beyond Pluto's orbit and the redetermination of the Sun's distance from the Galactic center by Van den Bergh renders a review of this curious relationship timely. It represents a further numerical relation between orbital radius and orbital velocity of astronomical systems in gravitational equilibrium, provided the spin of the revolving object is known. It may help to clarify whether the Galaxy revolves around a supergalactic center and what the rotation time of the tenth planet could be.

09.07.03 High Resolution Maps of the Sun and Moon at 7 Millimeter Wavelength, JOHN D.G. RATHER, N.R.A.O., and P.A.R. ADE, P. C. CLEGG, QUEEN MARY COLLEGE, LONDON. - The 36 foot radio telescope of N.R.A.O. has been used to map the sun and moon with a resolution of 1 minute of arc. Little, if any, limb darkening of the sun is observed. Areas associated with calcium filaments have temperatures several hundred degrees hotter than the undisturbed surrounding areas. Lunar maps show temperature differences between maria and highlands. An area of unusually rapid post-sunset cooling appears to exist near the western edge of Oceanus Procellarum.

Session 10: West Akers Hall, Room 138, 1500–1700

10.01.06 The Period and Near-Infrared Variations of IK Tau; G. W. LOCHMOOD, Kitt Peak National Observatory and R. F. WING, Ohio State University. - The late M-type Mira variable, IK Tau, formerly known as "MML Taurus", was first discovered during the Cal Tech Two-Micron Sky Survey. Narrow-band photometry at 1.04\mu during seven consecutive light cycles in the interval 1964-72 define its mean period as 465 ± 10 days, and confirm the epoch of zero phase in visual light as JD 2439440. Among the 300 M- and S-type Miras observed by us, IK Tauri has the largest I(104) amplitude, 2.7 mag, and only about two-dozen of these stars have brighter I(104) magnitudes at maximum light. IK Tau is also the only star observed to reach spectral