



BRANCH of ASTROGEOLOGY  
U. S. GEOLOGICAL SURVEY

PHOTO No. 16764 c

DATE \_\_\_\_\_

FLAGSTAFF, ARIZONA

Figure 12. --Granular magnesium silicate chondrule in Murray carbonaceous chondrite (Type II), containing fine black granules of matrix material and, near the periphery, larger "belted chondrules" of matrix material. The belts, or raised ridges, lie parallel to adjacent outer margins of the granular chondrule. Central cavities, observed in two black "chondrules" may be common in these inclusions.

The incorporation of low temperature matrix material in the granular chondrule indicates that precipitation (by sublimation?) of magnesium silicate was occurring during accretion, and that accretion occurred at and near the interface between high temperature and low temperature fractions. The oriented character of the "belted chondrules" and the presence of central cavities in them, also is considered evidence that both precipitation of magnesium silicate chondrules and accretion of volatile-rich materials occurred in a low pressure, probably gaseous environment.