

Co-Accretion of Chondrules and Fluffy Matrices

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Chondrules are the principal components of the most common meteorites, chondrites. This facts may mean that rocky planetesimals in our solar system are formed via accretion of chondrules. However, it is not yet understood how chondrules grow into planetesimals.

Several pieces of meteoritical evidence suggest that chondrites contained abundant nanograins in their matrices. These nanograins must play a key role for growth of dust aggregates. Therefore we examined a scenario in which rocky planetesimals are formed via co-accretion of chondrules and fluffy aggregates of nanograins.

Though our scenario succeeded in forming rocky planetesimals, we also found a new problem for "chondritic" planetesimal formation. If the mass fraction of chondrules is not high enough, and the density of matrices is too low to stop chondrules when dust aggregates collide, then the retention of chondrules in fluffy matrices is nontrivial. Future work on this point is needed.

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