Effect of interstellar organic grains on the origin of asteroids and meteorites

Akira Kouchi[1], Tatsuyuki Kudo[2], Hideyuki Nakano[3]

[1] Inst. Low Temp. Sci., Hokkaido Univ, [2] Inst. of Low Temp. Sci., Hokkaido Univ., [3] Low Temperature Sci,Hokkaido Univ

We present experimental results demonstrating that there were organic matter covered interstellar grains in the asteroid region and that the sticking threshold velocity of mm-size organic grains, 5 m/s, is several orders of magnitude higher than that of silicate and ice. This clearly shows that the formation of planetesimals occurred more rapidly in the asteroid region even in the turbulent accretion disk of the protosolar nebula than in the terrestrial and Jovian regions. Based on these results, we propose a new model on the origin and evolution of asteroids and meteorites.