

An experimental study of photophoresis in protoplanetary dust discs

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We present experimental results on the strength of the photophoretic effect within conditions similar to the pre-solar nebula.

Photophoresis happens whenever solid particles are subject to illumination while embedded within a gas. We have carried out microgravity experiments in which the photophoretic velocity of micrometer-sized dust particles was measured as a function of particle size, ambient gas pressure and light intensity, but especially for particles with various chemical compositions.

The results will be discussed with respect to implications to a previously proposed size sorting capability of chondrules and a possible formation of dust-enriched inner boundaries of protoplanetary dust discs.