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PHYSICAL FRACTAL AGGREGATES AND COMPUTER SIMULATIONS.

Abstract

Powders and condensation of vapors result under low gravity conditions in a variety of aggregates characterized by a non-integer fractal dimension. The patterns extend from purely random to highly regular. They consist of elements called monomers as they resemble chemical polymers at the atomic level. Substructures of the monomers reveal crystals down to the nanometer scale. A review of experimental techniques and results shall be followed by computer simulations of fractals embedded in three dimensional space. Multiple fractal aggregations shall be discussed. Proposals for future aggregation experiments on earth orbit and a current project destined to ISS (ICAPS)are to be described,as well as novel platforms for automated apparatus allowing extremely small and stable values of gravity.