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**Generalized Fibonacci Description of Fractal aggregates** CHRIS SORENSEN, WILLIAM HEINSON, AMIT CHAKRABARTI, Kansas State Univ. — We present a theory for calculating the fractal dimension of Diffusion Limited Cluster Aggregates (DLCA) based on cluster shape preservation. The shape is described by a d-dimensional Golden Mean, which is the ratio of consecutive d-dimensional Fibonacci numbers. For d =2 the canonical Fibonacci series is found with the Golden Mean value known since antiquity, phi = 1.618... to yield a fractal dimension of 1.44, in agreement with simulations and experiment. Generalizations to other dimensions are equally successful. Recent computer simulations also yield accurate values for the fractal aggregate prefactor, thus completing the theory.

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