

## **abstract**

Workshop on Topology: Identifying Order in Complex Systems  
Topic:

Speaker:

Affiliation:

Date:

Time/Room:

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I derive a new set of bounds on the percolation threshold of a class of continuum percolation models consisting overlapping convex hyperparticles in  $d$ -dimensional Euclidean space. The bounds converge to one another as the space dimension increases, but the tightest bound still provides an excellent estimate of the threshold, even for relatively low dimensions. It is shown that low-dimensional percolation behavior encodes high-dimensional information. Our analysis is aided by a certain remarkable duality between the equilibrium hard hyperparticles fluid system and the continuum percolation model of overlapping hyperparticles. Analogies between these two seemingly different problems are described. In particular, we connect the behavior of continuum percolation to the freezing point of the hard-hyperparticle system.