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**Discontinuous jamming transition in driven foam**[1]

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Aqueous foam (gas bubbles with liquid walls) is a surprising substance. Every molecule in foam is in a fluid state, either liquid or gas. Yet, the entire foam holds its shape as a solid would. In fact, when subjected to an applied strain at a slow enough strain rate, the initial response of the foam is the same as an elastic solid. On the other hand, under sufficiently large stress or strain, the foam can flow in a fashion similar to a fluid. This is similar to plastic flow that occurs in many "molecular" solids. In this talk, we will focus on experimental studies of the transition from solid behavior to flowing behavior, with an emphasis on to what degree this "jamming" transition is analogous to a "real" phase transition. We will focus on recent results using a model, two-dimensional foam: bubble rafts. Bubble rafts are a single layer of bubbles on the surface of water. By focusing on a two-dimensional system, it is relatively easy to track individual bubbles and gain insight into the connection between bubble dynamics (the mesoscopic scale) and the response of the entire foam (macroscopic scale). We will focus on recent measurements of a *discontinuous* transition from solid to fluid like behavior in the bubble raft.

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