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**Cooperative Symmetry Breaking from One to Three Dimensions in Multi-Component Double Emulsions** LAURA ADAMS, Physics Department and SEAS Harvard University, JACY BIRD, Mechanical Engineering Department, Boston University, JAIWEI YANG, SEAS Harvard University, THOMAS FRANKE, Microfluidic Group, EPI, Universtat Augsburg, Universitatsstr 1, Augsburg, Germany and Harvard University, VINOTHAN MANOHARAN, DAVID WEITZ, Physics Department and SEAS Harvard University — We follow the evolution of aqueous inner drops confined in a thin sheath of oil in the dimensional crossover from one to three dimensions using a fast camera and microfluidics. Surprisingly, inner drops interact cooperatively to pair with their next nearest neighbor to transform their linear configuration into a three dimensional composite sphere. The measured time scales of transforming these multi-component double emulsions are investigated as a function of number, size, and composition of inner drops. We model the dynamics to understand and predict how both folding and buckling occur in these complex microfluidic systems.

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