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Competition between phase separation and crystallization in attractive colloids BARBARA FRISKEN, ARTHUR BAILEY, JUAN SABIN[1], GABRIEL ESPINOSA[2], Simon Fraser University, Canada — We will present results from recent experiments on Earth and on the International Space Station investigating the interplay between phase separation and crystallization in samples prepared in the three-phase region (gas-liquid-crystal) of the phase diagram of a colloid-polymer mixture. On Earth, our samples first separate into a colloid-rich phase and a colloid-poor phase, with crystals forming in the colloid-rich phase. The denser phases sediment as expected. In microgravity, photographic images obtained in the BCAT-5 experiment reveal phase separation with crystal formation in the denser phase, where the phase separation continues normally until the dominant length scale is about 25% of the cell thickness, at which point both phase separation and crystal growth are arrested before macroscopic phase separation can occur. We propose that this arrest occurs because a crystalline network forms in the liquid phase and that the gas-liquid surface tension is not sufficient to overcome the stiffness of this network.

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