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Toward complex network droplets – a computational study of bicontinuous network regions in star polymer droplets RYAN MARSON, SHARON GLOTZER, Univ of Michigan - Ann Arbor — The complexity and functionality of network phases in soft matter systems offer a wealth of possible technological applications ranging from photonics to medicine. Through Dissipative Particle Dynamics (DPD) simulations, with explicit solvent, of over 1 million particles we demonstrate control of nano- and micro- scale ordering in star polymer droplets. By tuning the building block geometry and interactions between star polymer components we produce a droplet phase diagram. In particular we highlight regions of the structure that contain phase separated bicontinuous network domains. This system demonstrates the possibility of functional droplets composed of complex networks, with a hierarchy of scales that can be tuned for specific applications.

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