

# Soft Materials for Autonomous Motion and Mesoscale Assembly

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Online [link here](#) via MS Teams

Nature is a master at using limited components and basic driving forces to achieve complex tasks, such as high-power movement and multi-structure assembly, across a broad range of size scales. The materials that enable these achievements often rely upon the integration of phases that allow for internal transport, elastic energy storage, system protecting dissipation, and tunable sensitivity to interfacial interactions. I will present two examples of how to take advantage of mesoscale structural asymmetry along with materials phases that use similar attributes to those found in nature to achieve new engineered capabilities. The first example takes inspiration from multiple examples in nature, such as trap-jaw ants, that use Latch-Mediated Spring Actuation (LaMSA) to achieve high power movements. The second example uses structural asymmetry to mediate swelling/deswelling processes and elastic restoring forces to control the motion and assembly of mesoscale polymer gel ribbons. Both examples provide new insight into how polymer gel properties can combine with purposeful structural design to perform complex tasks.



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