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Undulating Underperformance: Swimming in Elastic Media[1] XIAONING SHEN, PAULO ARRATIA, University of Pennsylvania — In this talk, we investigate the effects of fluid elasticity on the swimming behavior of the nematode *Caenorhabditis elegans* by tracking the nematode's motion and measuring the corresponding velocity fields. We find that fluid elasticity hinders self-propulsion and fluid transportation. Compared to Newtonian solutions, fluid elasticity leads to 35% slower propulsion speed. Furthermore, self-propulsion and fluid transportation are weakened as elastic stresses grow in magnitude in the fluid. This decrease in self-propulsion in viscoelastic fluids is related to the stretching of flexible molecules near hyperbolic points in the flow.

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