Abstract Submitted
for the MAR17 Meeting of
The American Physical Society

Flexible active filaments confined to curved surfaces or in flexible encapsulation: simulation studies[1] MICHAEL VARGA, Kent State University, LUCA GIOMI, Universiteit Leiden, ROBIN SELINGER, Kent State University — We model self-propelled flexible active filaments (FAFs) in complex geometries. First, we examine FAFs on a curved substrate with alternating regions of +/- Gaussian curvature. We study motility-induced phenomena including giant number fluctuations, anomalous diffusion, collective motion, and dynamic topology, and identify how collective behaviors are modified by variations in surface curvature. We compare these results to related models of active matter on curved substrates. Next, we consider FAFs encapsulated in a deformable ring and identify mechanisms of spontaneous symmetry breaking and pattern formation as a function of filament properties and encapsulation stiffness. Finally, we discuss how these mechanisms can be explored via potentially relevant experiments.

[1]Supported by NSF DMR-1409658 and by the Lorentz Institute.

Robin Selinger
Kent State University

Date submitted: 11 Nov 2016 Electronic form version 1.4