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Fractal generation in self-driven active nematic fluids[1] KEVIN MITCHELL, AMANDA TAN, LINDA HIRST, University of California, Merced — Active fluids, composed of individual self-propelled agents, can generate complex large-scale coherent flows. A particularly important and popular laboratory realization of such an active fluid is a system composed of microtubules, aligned in a 2D nematic phase, and driven by ATP-fueled kinesin biomolecular motors. This system exhibits robust chaotic advection, giving rise to a pronounced fractal structure in the nematic contours. Though these fractal patterns are reminiscent of passively advected dye in 2D chaotic flows at low Reynolds number, the underlying mechanism for fractal generation is more subtle in active nematics. In this talk, we present an alternative theory for fractal generation and compare the predicted fractal scaling to experimental data.

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Kevin Mitchell
University of California, Merced

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