MAR12-2011-000304

Abstract for an Invited Paper
for the MAR12 Meeting of
the American Physical Society

Chiral patterning in Paenibacillus colonies under stress

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One of the most striking examples of bacterial colony patterning occurs in the C-morphotype of Paenibacillus strains. Here, macroscopic chirality results from the interaction of local liquid-crystal ordering of the long bacterial cells with the self-propelled motility driven by the non-reflection-symmetric flagella. This talk will review some of the original experimental data from the Ben-Jacob lab as well as recent insight obtained via genomics. I will then discuss attempts to model and simulate the chiral patterns via solving reaction-diffusion equations on random lattices. At the end, I will introduce the challenges still to be faced in understanding transitions between these patterns and more common branching structures